Exposure Database and Surveillance System

Documentation and Software Manual

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Contributors and Acknowledgements

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Introduction
This program was developed as part of a federal research grant provided by the National Institute of Occupational Safety and Health (NIOSH) with money from the Department of Energy (DOE). The program is not intended to be an all encompassing computer database system for Occupational Health professionals, instead it is intended to provide a framework for the collection and storage of the essential data elements needed to start an effective exposure surveillance program.

The program is intended for use on a single desktop computer or for sharing over a small network. The program is not intended for large-scale client server environments.

System Requirements
Pentium class computer with 16 MB of ram and 20 MB of free disk space. Microsoft Windows 95 or higher and Microsoft Access 97. An untested version of this software is available that does not require Microsoft Access 97.

Program Design
This application is a relational database consisting multiple tables linked together by common fields or keys. There are three types of tables in this program:

Data Tables	used to store entered data such as information about air samples or direct reading samples.
Look-up Tables	used to store supporting data such as employee ID's and chemical agent information such as PEL's and TLV's.
Temporary Tables	used to perform analyses and reports.

A user of this program will never see the actual tables or table structures used in this program. However, for reference purposes a simplified database structure is presented in Appendix I.

Instead of seeing tables, the user works with data in forms and reports. Forms are used for entering, viewing, and editing single records. Reports are used for viewing groups of related records.

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1. Forms

Display data for a record in a way that is easier to add data, view already entered data and make changes instead of adding information directly to the table. Forms have special capabilities that allow a programmer to use programmed logic and limit the entries to specific values which prevents possible errors in data entry. In addition, forms can be used to filter data so that only records containing a desired value are displayed.

1.1 Navigating

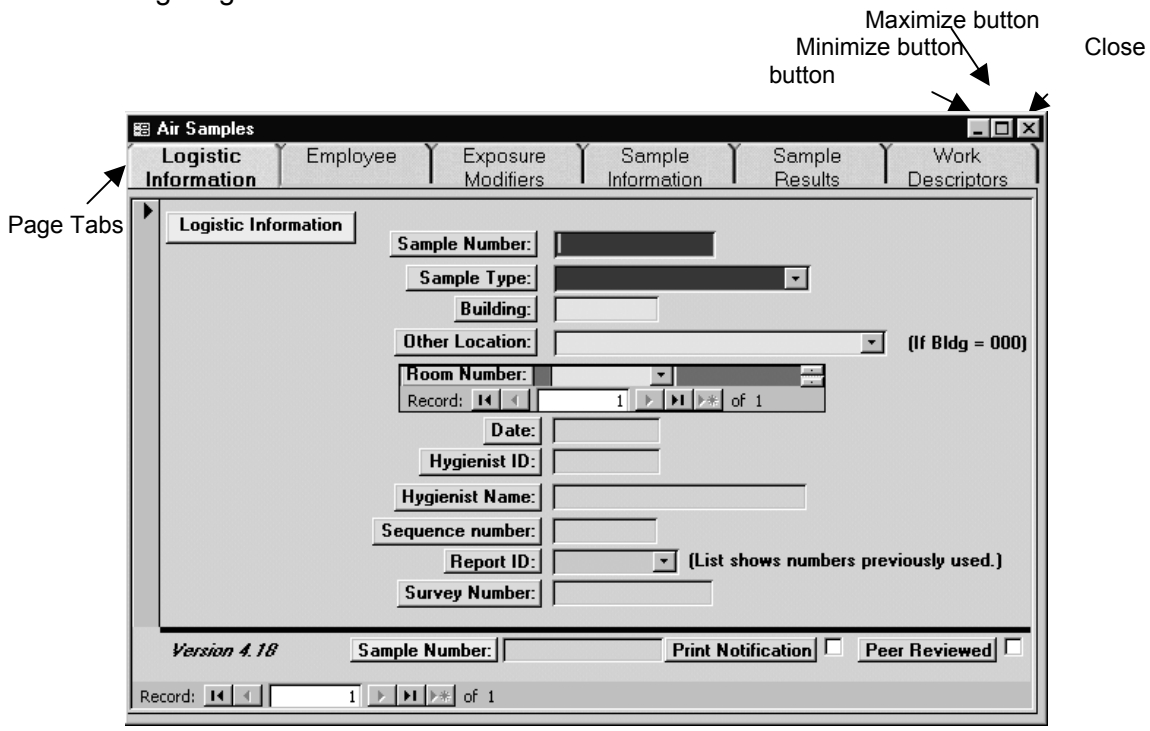

Figure 1- Example of data entry form showing screen elements.

1.1.1 Page Tabs

Selecting a form tab will transfer the user between pages on a form.

1.1.2 Minimize Button

The minimize button will reduce the form to a small window at the bottom of the screen, enabling the user to view other screens in the same application. (See minimized window below.)

To return the screen to its former size, select either the restore button  or the maximize button 

1.1.3 Maximize Button

The maximize button will enlarge the active screen so that it fills up the active window.

1.1.4 Close Button

The close button will close the form that is currently active. This button is used to close any form being worked on and return to the Switchboard form.

1.1.5 Tab Key

Pressing the tab key in a form moves the cursor to the next field. In this manner the tab key may be used to maneuver through the fields in the form. The tab key will not enable the cursor to be positioned in a field in which data entry is not allowed (light green fields)

1.1.6 Navigating in Subforms

Subforms are a forms embedded within another form. Usually, the subform has a many-to-one relationship with the main form. That is, for every record in the main form, there can be multiple corresponding records in a subform. A subform would look similar to this:

The arrows at the bottom of the subform are used to navigate through the records in the
subform.

To advance a record, select this  button:

To go back a record, select this  button:

To move to the first or the last records in a subform, select these buttons
  respectively:

The main form has similar buttons to navigate through the records. Keep in mind that the subform will display multiple records related to the record displayed in the main form. When the records are scrolled through in the main form, the records displayed in the main form and the subform change. When the records in a subform are scrolled through, the records in the subform change, but the record in the main form remains the same.

1.3 Entering Data

Data is entered into the form by first positioning the cursor in the desired field (the cursor will usually be in the first field when a form is opened) and entering the appropriate data for that field. The tab key is used to move the cursor to the next field, so the next piece of data may be entered. Once the record on that screen is complete, the navigation buttons at the bottom of the screen are used to advance to a new record to enter data for a different record. The page tabs are used to change pages within the form to enter more data for the same record.

2. Field Types

Different fields require different methods for data entry. Some require the user to type in a value while some allow the user to select the value from a list.

2.1 Regular Data Entry

A regular data entry field or text box appears as just a rectangular box, as shown below.

The label to the left indicates what type of data should be entered into the field.

2.2 Drop Down Lists

A drop down list field allows the user to select the value for the field from a list. The list is accessed by selecting the arrow button to the right of the field with the mouse. Once the list appears, the desired value may be selected from the list by clicking on the value in the list.

Depending on the field, new values that are not in the list may or may not be typed in.

2.3 Check Boxes

Check boxes are fields in which the data stored for that field is either Yes or No (or True or False). These fields are displayed as check boxes on the form.

A check in the box means Yes (see below), a blank box, as above, means No.

To enter a check, or to remove a check, click on the box with the mouse.

3. Command Buttons

Command buttons are buttons on a form which perform an action such as opening another form or report. For example, the following command button will allow the user to add a new employee to the list of employees in the database by opening the Employee Information Form.

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1. Forms

The various forms of the database provide an easy way to add, edit, and review records in the database.

1.1 Opening the forms

When the program is opened, the Switchboard form will be in the center of the screen. This Switchboard form allows the user to open the data entry forms in whichever view is desired. It also allows the user to print out reports on the data entry and perform selected data analysis. To open the data entry forms, the Data Entry tab must be selected on the Switchboard form (it will appear light green and forward from the Reports and Data Analysis tabs).

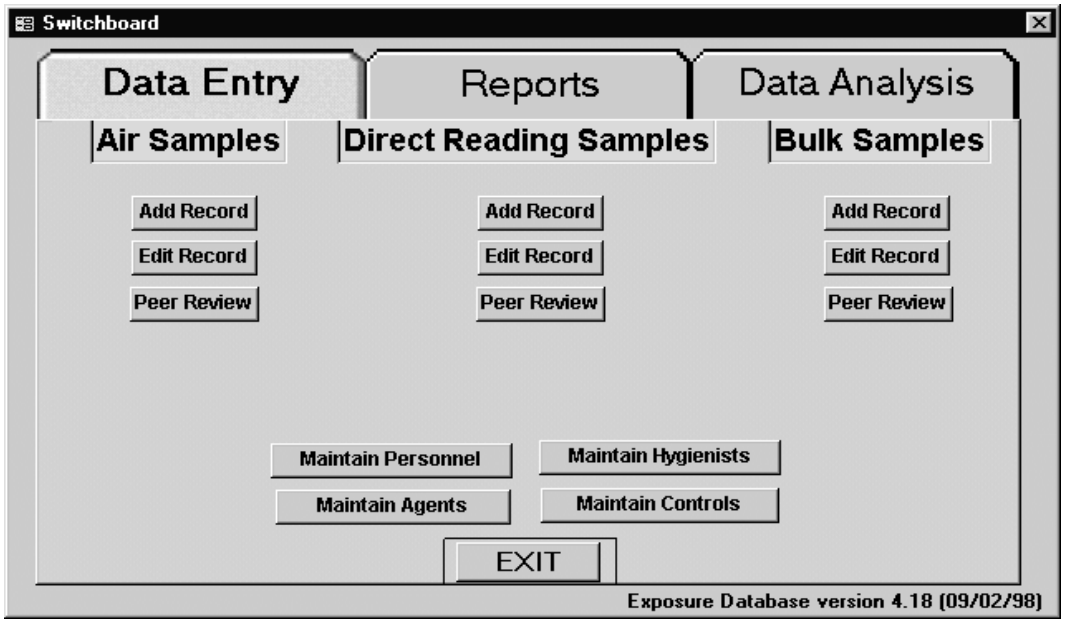


Figure 2 – Switchboard form

1.1.1 Adding records

To add records to the Air Samples, Direct Reading Samples, or Bulk Samples forms, select the Add Record button under the appropriate heading for the form desired. Selecting this button for the desired form will open the form to a blank record. The form will not display previously entered records.

1.1.2 Editing  records

To edit records in the Air Samples, Direct Reading Samples, or Bulk Samples forms, select the Edit Record button under the appropriate heading for the form desired. Selecting this button for the desired form will open the form with all the records available to scroll through. Changes can be made to any record in the database.

1.1.3 Peer Reviewing  records

To perform a peer review on a record in the Air Samples, Direct Reading Samples, or Bulk Samples forms, select the Peer Review button under the appropriate heading for the form desired. Selecting this button for the desired form will open the form with all the records that have not been marked as peer reviewed available for review.

1.2 Air Samples Form
Allows the user to add, edit, or review air sample data.

1.2.1 Logistic Information Page
Allows the user to add, edit, or review logistic information for an air sample such as sample number, location, and date.

1.2.2 Employee Page
Allows the user to add, edit, or review employee information for an air sample.

1.2.3 Exposure Modifiers Page
Allows the user to add, edit, or review information concerning respiratory protection, engineering controls, and personal protective equipment worn.

1.2.4 Sample Information Page
Allows the user to add, edit, or review information about the sample, such as the flow rate and sampling time.

1.2.5 Sample Results Page
Allows the user to add, edit, or review the sample results including the amount reported by the laboratory and the time-weighted average concentration.

1.2.6 Work Descriptors Page
Allows the user to add, edit, or review information about the work type and tasks performed by the worker during the sampling period.

1.3 Direct Reading Samples
Allows the user to add, edit, or review direct reading sample data from instruments such as an organic vapor analyzer or hand-held sampling pump.

1.3.1 Logistic Information Page
Allows the user to add, edit, or review logistic information for a direct sample such as sample number, location, and date.

1.3.2 Sample Information Page
Allows the user to add, edit, or review information pertaining to a direct sample, such as the sample type and instrument.

1.3.3 Sample Results Page
Allows the user to add, edit, or review the results of a direct sample including concentration and process description.

1.4 Bulk Samples
Allows the user to add, edit, or review bulk sample data.

1.5 Miscellaneous Forms
These forms allow the user to enter information that will be used to look up and fill in fields in the other forms, when that information is not already available.

1.5.1 Maintain Personnel
Allows the user to enter employee information for a new employee including name, work location, and job title.

1.5.2 Maintain Hygienists
Allows the user to enter and edit hygienist names and ID's.

1.5.3 Maintain Agents
Allows the user to enter or modify information for a chemical agent including PEL's and TLV's.

1.5.4 Maintain Controls
Allows the user to add or modify the description of an engineering control or piece of personal protective equipment.

1.5.5 Maintain Work Descriptors
Allows the user to enter or edit codes and descriptions for work types and tasks.

2. Field definitions
The places in a form where data is entered, or looked up, are considered fields. Each of these fields has a specific type of data that is to be entered in that field.

2.1 Field Color
The color of the field to enter data into has a meaning regarding what type of data is collected there. For example, one color denotes that data entry is required, while another color denotes that the value is calculated from other fields.

2.1.1 Red
Fields with a red background are required. A value must be entered in these fields for the correct calculations to be made and for data to be sorted properly. A record cannot be saved without all the required fields filled.

2.1.2 Light Blue
Fields with a light blue background are not required for data entry. Some of these fields will be automatically filled when a value is entered in another field, and all may be filled in manually if information is available. Values in these fields can be modified and may remain empty.

2.1.3 Light Green
Fields with a light green background are calculated or looked up based on data entered in other fields in the form. The values in these fields are not modifiable.

2.2 Air Samples Form
Fields in the Air Samples Form contain data collected during an air sample.

2.2.1 Logistic Information page

Fields on this page of the Air Samples form contain logistic information about the air sample, such as the type of sample, sample number, and the hygienist responsible for the sample.

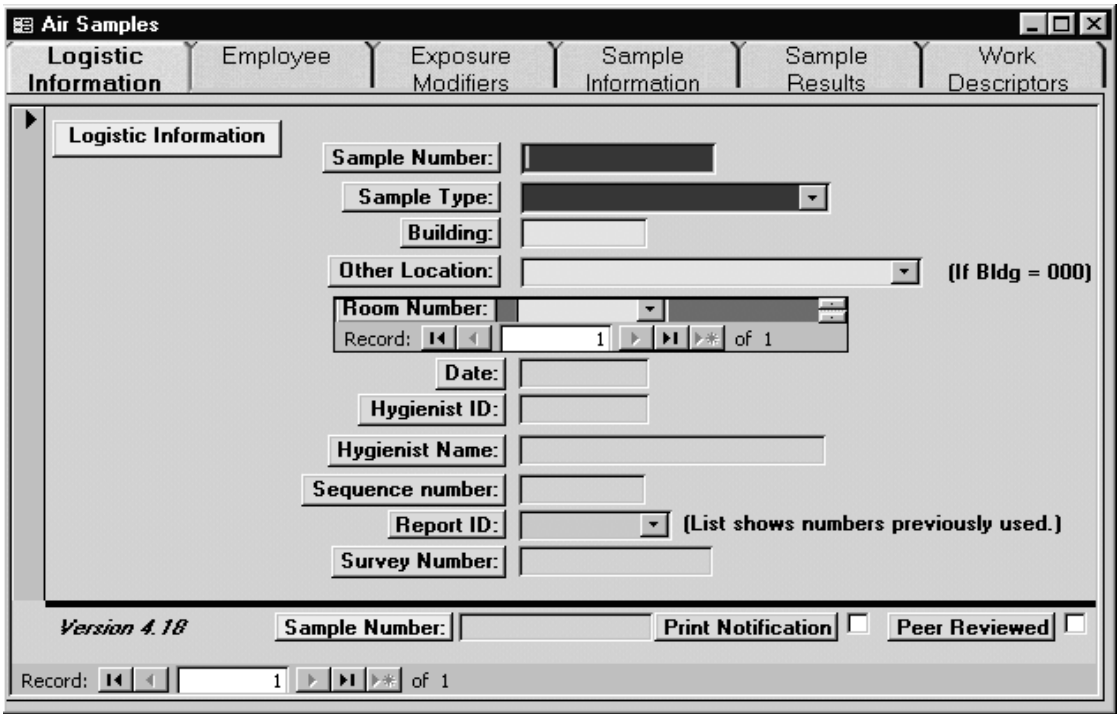


Figure 3 – Air Sample form Logistic Information page

2.2.1.1 Sample Number

This is a required field that contains the sample number for the sample. The sample number is made up of the building, the date, and the hygienist ID. The values entered in this field determine the values of other fields in the form. The format of the sample number is BBB-YY/MM/DD-IH-SS where BBB is the building number, YY is the two digit year, MM is the two digit month, DD is the two digit day of the month, IH is the hygienist ID number, and SS is a two digit sequence number indicating the sample number for that day by that hygienist. An example would be 371-96/08/23-99-01.

2.2.1.2 Sample Type

A required field in which the value must be selected from the drop-down list of options displayed when the down arrow is selected. Possible values are:

Area	A sample taken in a particular area to estimate ambient concentrations.
Breathing zone	A sample taken by placing a filter or tube in the breathing zone of a worker for an entire task or work period.
Blank	A sample submitted to a laboratory as a field or media blank.
Spike	A sample submitted to a laboratory with a known amount of contaminant to provide a quality assurance test.

Source	A sample taken as close to a process as possible in order to estimate a worst case exposure from the process.
Unknown	A designation reserved mostly for historical samples where the sampling method is unknown.

2.2.1.3 Building

This field contains the building number where the sample was collected. This field will automatically be filled in from the sample number but can be modified to give more detail.

2.2.1.4 Other Location

This is an optional field that contains data identifying the location of the sample if the sample was not performed in a building. This value may be selected from the drop down list, or a value may be typed in if it is not found among the drop down list items. Examples might be valve vault or cargo container.

2.2.1.5 Room Number

This field contains the room number(s) in which the sample was performed. The value may be selected from the drop down list, or may be typed in if not found in the list. Since the sample could have been taken in multiple rooms, this field is contained in a subform, allowing the user to enter multiple room numbers for one sample.

2.2.1.6 Date

This field does not allow data entry, and is automatically filled in from the sample number representing the date the sample was collected.

2.2.1.7 Hygienist ID

This field does not allow data entry or modification. The field is automatically filled in from the sample number and consists of a unique two digit number for each hygienist.

2.2.1.8 Hygienist Name

This field does not allow data entry or modification and is automatically looked up and filled in using the hygienist ID from the sample number. New hygienists can be added using the Maintain Hygienists button on the Switchboard form.

2.2.1.9 Sequence Number

This field contains the sequence number for the sample. The field does not allow data entry, and is filled in from the sample number. The hygienist starts a new sequence of numbers each day starting at one (01) to insure that each sample has a unique number.

2.2.1.10 Report ID

This field contains the three digit report ID which the sample will be included in. The report ID may be selected from the drop down list, which contains previously used report ID's for the hygienist who performed the sample, or a new number may be added.

2.2.1.11 Survey Number

The survey number field does not allow data entry, but is automatically filled in from the industrial hygienist ID, the year of the sample, and the report ID. The format of the Survey Number is IH-YY-###. The use of a Survey number allows a group of samples to be easily grouped in a report.

2.2 Employee page

This page contains data regarding the employee provided the sample was a breathing zone sample. If the sample type was not a breathing zone, then the Employee ID field would appear as a light green field, and would not allow any employee ID number to be entered.

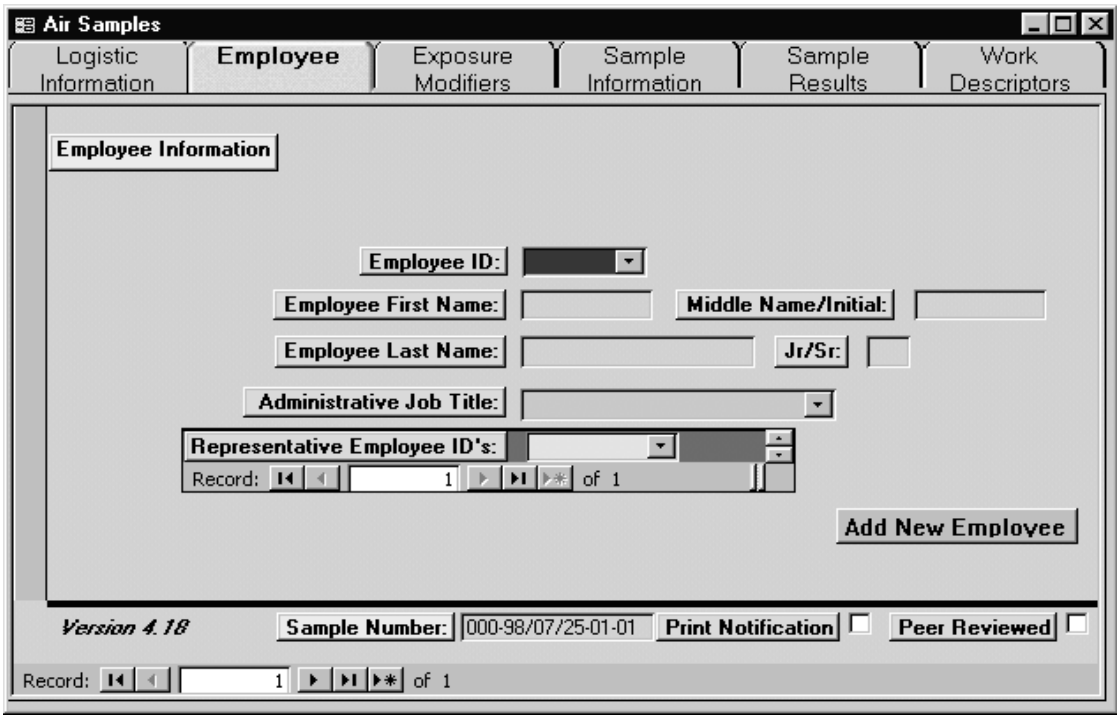


Figure 4 – Air Sample form Employee page

2.2.2.1 Employee ID

This field contains the employee ID for breathing zone samples and the value is limited to those contained in the drop-down list. The value is required if the sample is a breathing zone. If not, no data may be entered in this field. New Employees may be added using the Add New Employees command button.

2.2.2.2 First Name

This field does not allow data entry and is filled in based on the employee ID selected in the Employee ID field. This field contains the employee's first name.

2.2.2.3 Middle Name/Initial

This field does not allow data entry and is filled in based on the employee ID selected in the Employee ID field. This field contains the employee's middle name or initial.

2.2.2.4 Employee Last Name

This field does not allow data entry and is filled in based on the employee ID selected in the Employee ID field. This field contains the employee's last name.

2.2.2.5 Jr/Sr

This field does not allow data entry and is filled in based on the employee ID selected in the Employee ID field. This field contains the employee's Jr., Sr., II, or III designation, if appropriate.

2.2.2.6 Administrative Job Title

This field will automatically be filled in based on the employee ID number selected and the most current job title for that individual. If the value is inaccurate, a value may be selected from the drop down list. This list contains values for all the job titles recorded in the database. A value must be selected from the list, no custom entries may be made. To permanently change the job title of the employee it must be changed using the Maintain Employees button on the main switchboard.

2.2.2.7 Representative Employee ID's

This field contains the employee ID numbers for individuals whose exposures can be considered similar to the employee listed in the Employee ID field. Since there can be multiple representative employee ID's for one sample, this field is contained on a subform. Just like the Employee ID field, the representative employee ID numbers must be selected from the drop down list.

2.2.3 Exposure Modifiers page

Fields on this page contain information regarding respiratory protection and other exposure modifiers used during the sampling period. All the fields on this page are optional.

2.2.3.1 Respirator

This field is optional in that it may remain blank. When a value is to be entered in this field indicating the type of respirator used, it must be selected from the drop down list. Choices include half-face respirator, full-face respirator, airline respirator, powered air purifying respirator, self contained breathing apparatus, and none. Although this field is optional, it is important that it be filled in to obtain a more complete exposure profile. Additional respirator options can be added using the Add New Controls command button.

2.2.3.2 Respirator Canister

If a respirator was used during the commission of the air sample, the respirator canister may be entered using the values in the drop down list for

this field. No other values may be entered in this field. Additional canister options can be added using the Add New Controls command button.

2.2.3.3 Type of Work Area

The type of work area may be described by selecting a value from the drop down list. Possible values are outdoor, indoor, confined space, or other. No other values may be entered in this field.

2.2.3.4 Engineering Controls

The engineering control used may be selected from the drop down list. Possible values are lab hood, local exhaust, HEPA vacuum, glove box, enclosure, charcoal drum filter, and none. Additional engineering controls may be added using the Add New Controls command button.

2.2.3.5 Eye/Face Protection

If any eye or face protection was worn, the type of equipment used may be entered in this field by selecting a value from the list. Only values from the list may be entered in this field, however elements can be added to the list using the Add New Controls command button.

2.2.3.6 Hand/Arm Protection

If any hand or arm protection was worn, the type of equipment used may be entered in this field by selecting a value from the list. Only values from the list may be entered in this field, however elements can be added to the list using the Add New Controls command button.

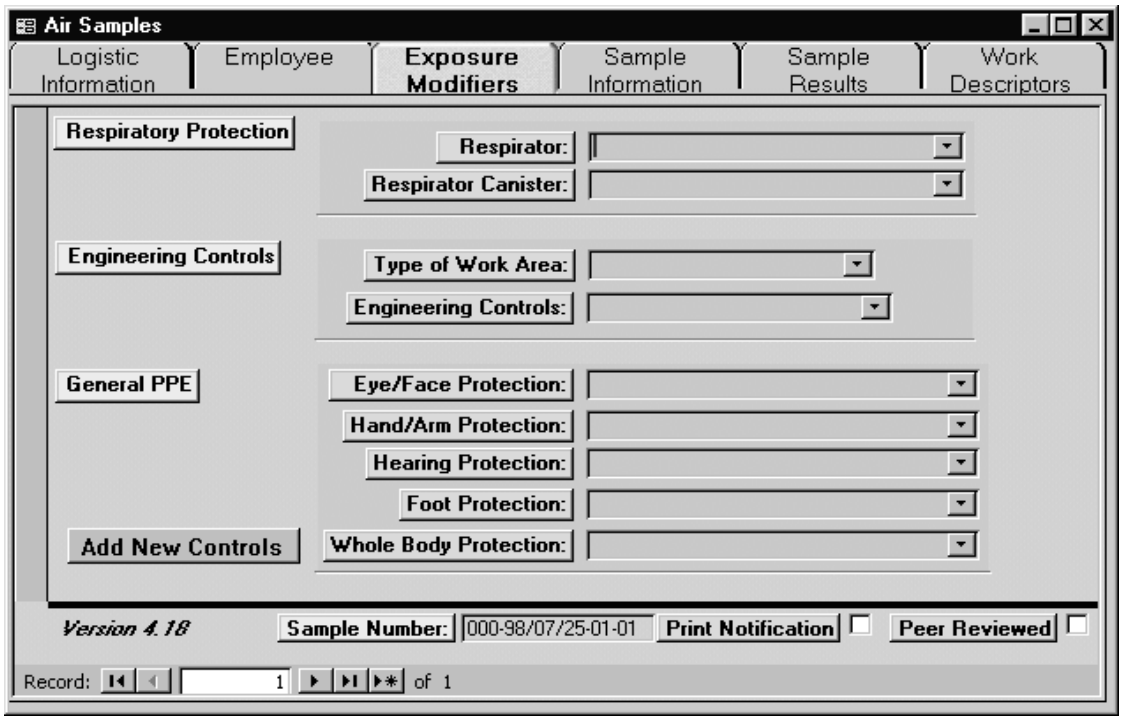


Figure 5 – Air Sample form Exposure Modifiers page

2.2.3.7 Hearing Protection

If any hearing protection was worn during the sample, the type of equipment used may be entered in this field by selecting a value from the list. Only values from the list may be entered in this field, however elements can be added to the list using the Add New Controls command button.

2.2.3.8 Foot Protection

If any foot protection was worn during the sample, the type of equipment used may be entered in this field by selecting a value from the list. Only values from the list may be entered in this field, however elements can be added to the list using the Add New Controls command button.

2.2.3.9 Whole Body Protection

If any equipment was worn to protect the whole body, the type of equipment used may be entered in this field by selecting a value from the list. Only values from the list may be entered in this field.

2.2.4 Sample Information page

The fields on this page allow the user to enter general information regarding the sample.

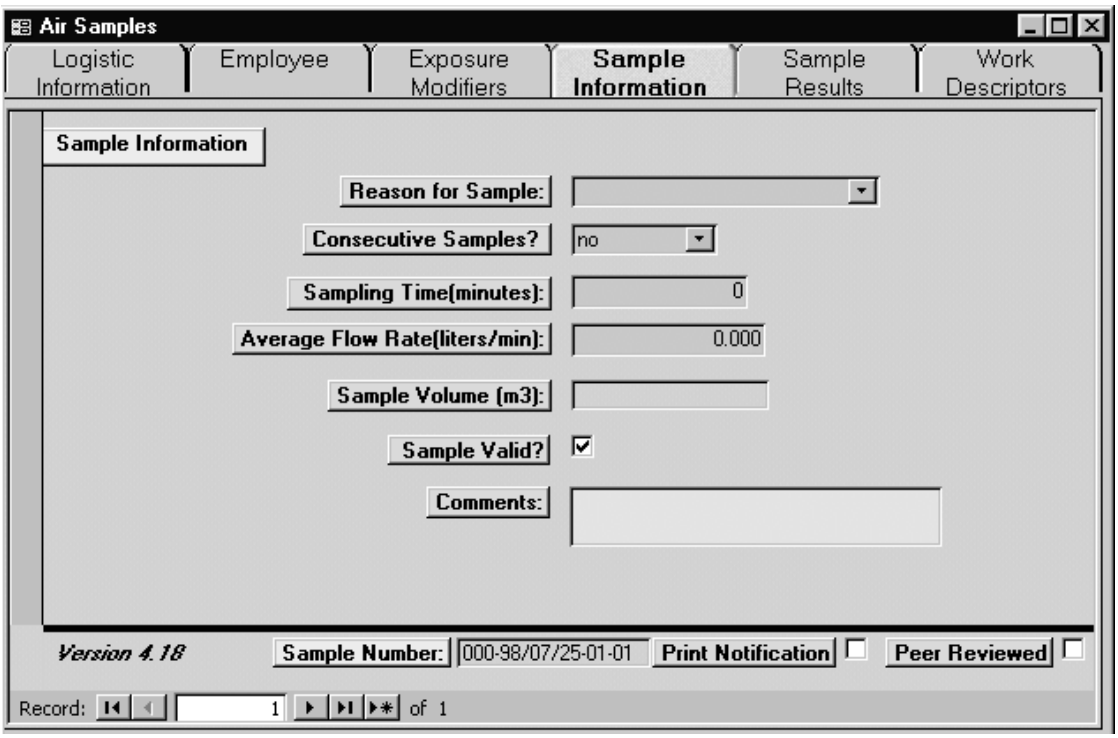


Figure 6 – Air Sample form Sample Information page

2.2.4.1 Reason for Sample

The reason that the sample was performed may be entered in this field by selecting the appropriate value from the drop down list. Only values selected from the list are allowed. Possible values include initial exposure characterization, periodic check, employee concern, emergency/spill,

suspected high exposure, other, or unknown. Although not required, this is an important field when making comparisons between samples.

2.2.4.2 Consecutive Samples?
This field is used for consecutive or multiple partial period samples used to characterize a workday's exposure. The value must be selected from the list of choices including yes and no. In order to relate the different samples in the series they must have consecutive sample numbers. The default value for this field is no.

2.2.4.3 Sampling Time(minutes)
This field contains the sample duration in minutes. The value must be entered in numeric characters. The field will not accept text characters.

2.2.4.4 Average Flow Rate(liters/min)
This field allows the user to enter the average flow rate for the sample in numeric characters. This is the average of the pre and post calibration flow rates in liters per minute.

2.2.4.5 Sample Volume (m^3)
This field does not allow data entry. The value in the field is calculated from the sample time and the average flow rate.

2.2.4.6 Sample Valid?
This check box allows the user to denote whether the sample is valid. The sample can be declared invalid if the pump stops in the middle of the sample or there is excessive employee tampering. It is important to note the reason the sample is invalid in the Comments field. The default is Yes, depicted by a check in the check box.

2.2.4.7 Comments
Any comments regarding the sample may be entered in this field. This is a free-form text field allowing a maximum of 255 characters of data entry.

2.2.5 Sample Results
This page of the Air Samples form contains fields that allow the user to enter the results from the sample. The fields in this form can have multiple entries for each sample, therefore the fields are located on a subform.

2.2.5.1 Contaminant
This field allows the user to enter the contaminant(s) or chemical agent(s) that were analyzed by the laboratory. The value must be selected from the drop down list. Values selected from the drop down list will allow two of the other fields in the subform to be automatically filled in including Lab unit and TWA unit. The values in the drop down list include only those where the "Add to List on Air Sample Form" checkbox on the Maintain Agents form has been checked. Agents can be added using the Add New Agents command button, however, it is important to note that all agents with PEL's or TLV's can be looked up via the Maintain Agents form.

2.2.5.2 Lab unit

This field does not allow data entry. The lab unit will be filled in depending on the appropriate unit of measure for the contaminant tested. Units can be changed using either the Maintain Agents command button on the Switchboard or the Add New Agents on the Air Sample form. It is important to realize that if the unit of measure is changed the unit of measure for the PEL or TLV should also be changed to insure accurate comparisons. The current values assume that all concentrations should be reported in milligrams per cubic meter (except for a few selected agents such as silica and asbestos).

2.2.5.3 Below LOD?

This field allows the user to denote whether the contaminant level was below the limit of detection for that contaminant. The default value is No. If the contaminant is below the level of detection, the Yes value may be selected from the list and the reported value on the laboratory report added to the Lab Result field. Zeros should never be used instead of the reported value.

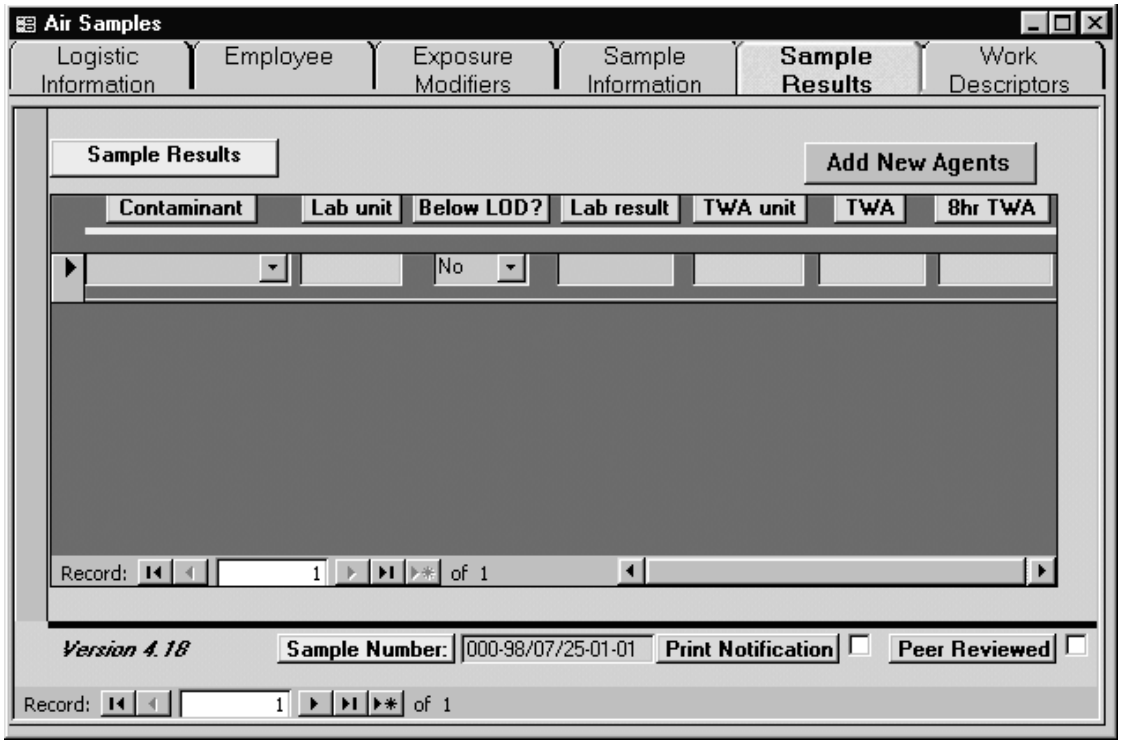


Figure 7 – Air Sample form Sample Results page

2.2.5.4 Lab result

This field contains the numerical value from the laboratory representing the amount of contaminant on the sample media. This is not the air concentration. Only a numerical value may be entered in this field.

2.2.5.5 TWA unit

This field does not allow data entry. The value for this field is automatically filled in based on the contaminant tested. The field is looked up from the value in the TWA Units field on the Maintain Agents form.

2.2.5.6 TWA

This field represents the concentration of the contaminant in the air during the sampling period. The field does not allow data entry. The value for this field is calculated by dividing lab result by the sample volume.

2.2.5.7 8hr TWA

This field represents the eight-hour time weighted average exposure. It is a calculated field and does not allow data entry. The value is calculated by the following formula:

$$\text{8hr TWA} = \text{TWA} \times \frac{\text{Sampling Time in Min}}{480}$$

2.2.6 Work Descriptors Page

The fields on this page allow the user to enter information related to the work type and tasks performed during the sampling period.

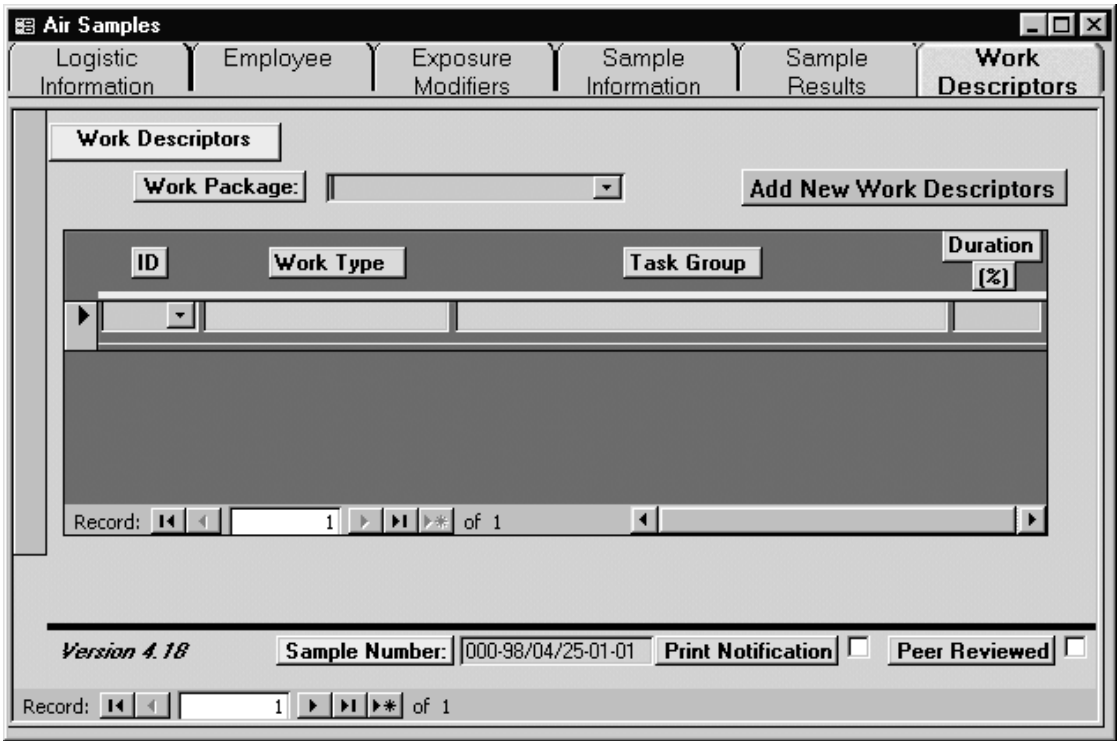


Figure 8 – Air Sample form Work Descriptors page

2.2.6.1 Work Package

This field allows the user to select a value from the drop down list, or to type in a value manually. The field represents the work package or work order number that the work was performed under.

2.2.6.2 ID

This field is located on a subform, allowing the user to enter multiple numeric ID s for one sample. The ID must be selected from a value in the list and represents a unique combination of work type and task. Table I shows examples of the types of work codes that can be used. Additional ID's can be entered using the Add New Work Descriptors command button.

2.2.6.3 Work Type

This field does not allow data entry. The appropriate work type value will be automatically filled in based on the value selected in the ID field. The types of values that should be used for Work Type are shown in Table I and further outlined in Appendix II.

2.2.6.4 Task Group

This field does not allow data entry. The appropriate task group value will be automatically filled in based on the value selected in the ID field. Table I shows examples of the types of general task groups that should be used.

2.2.6.5 Duration

This field represents the percentage of the sampling period that each task was performed. The sum of all the values in the Duration field should add up to 100% for each sample. This is an optional field requiring that the value be in numerical characters. Text characters will not be accepted.

Table I – Examples of work types and task groups

Work Type	ID	Task Group / Task
Cleanup	CU1.	Use of hand tools for size reduction, dis-assembly, etc.
	CU2.	Use of powered tools (e.g. Sawzall, drill) for size reduction, dis-assembly, etc.
	CU3.	Hot cutting or welding
	CU4.	Decon: Wet methods
	CU5.	Decon: Mechanical methods (e.g. dry wiping, sweeping)
	CU6.	HEPA Vacuuming
	CU7.	Abrasive methods (e.g. sanding, grinding, CO2 blasting)
	CU8.	Draining of pipe, tank, or other container
	CU9.	Coating removal (paint, adhesives, etc.)
	CU10.	Asbestos removal/abatement (including clearances samples)
	CU11.	On-site transport of waste materials
	CU12.	Materials consolidation
	CU13.	Sorting, packaging, or re-packaging waste materials
	CU14.	Demolition of buildings or other large structures
	CU15.	Environmental remediation
	CU16.	Application of fixatives to surfaces to contain contaminants
	CU17.	Polymer Macro-Encapsulation
	CU99.	Miscellaneous--not covered by current coding choices
Waste Management	WM1.	Waste treatment (e.g. thermal desorption, vitrification)
	WM2.	Waste storage operations (draining, venting, aspirating, etc. of any type of container, including tanks, drums, pipes, etc.)
	WM3.	Handling wet combustibles (high solvent content)
	WM4.	Leak/spill response or follow-up (environmental or indoors)
	WM99.	Miscellaneous--not covered by current coding choices

Assessment of Contamination	AC1.	Collection of samples or use of Direct Reading Instrument (e.g. Geiger Counter, Organic Vapor Meter)
Observation	OB1.	Observation of any Work Type or Task Group
Facility Maintenance	FM1.	House-keeping (e.g. mopping, sweeping, trash removal)
	FM2.	Ventilation system maintenance
	FM3.	General maintenance of equipment or building (e.g. building repairs, bulb replacement, minor construction)
	FM99.	Miscellaneous--not covered by current coding choices
Process Verification	PV1.	Production, usually limited, done for purposes of verifying processes or techniques
	PV99	Miscellaneous--not covered by current coding choices
Conversion	CV1.	Re-furbishment of equipment
	CV2.	Re-furbishment of building
	CV99.	Miscellaneous--not covered by current coding choices

2.3 Direct Reading Samples Form

Fields in the Direct Reading Samples form contain information relevant to a direct reading sample such as would be seen from an organic vapor meter or hand held sampling pump.

2.3.1 Logistic Information

This page contains fields that allow the user to enter general information about the direct reading sample such as sample number, location, and date.

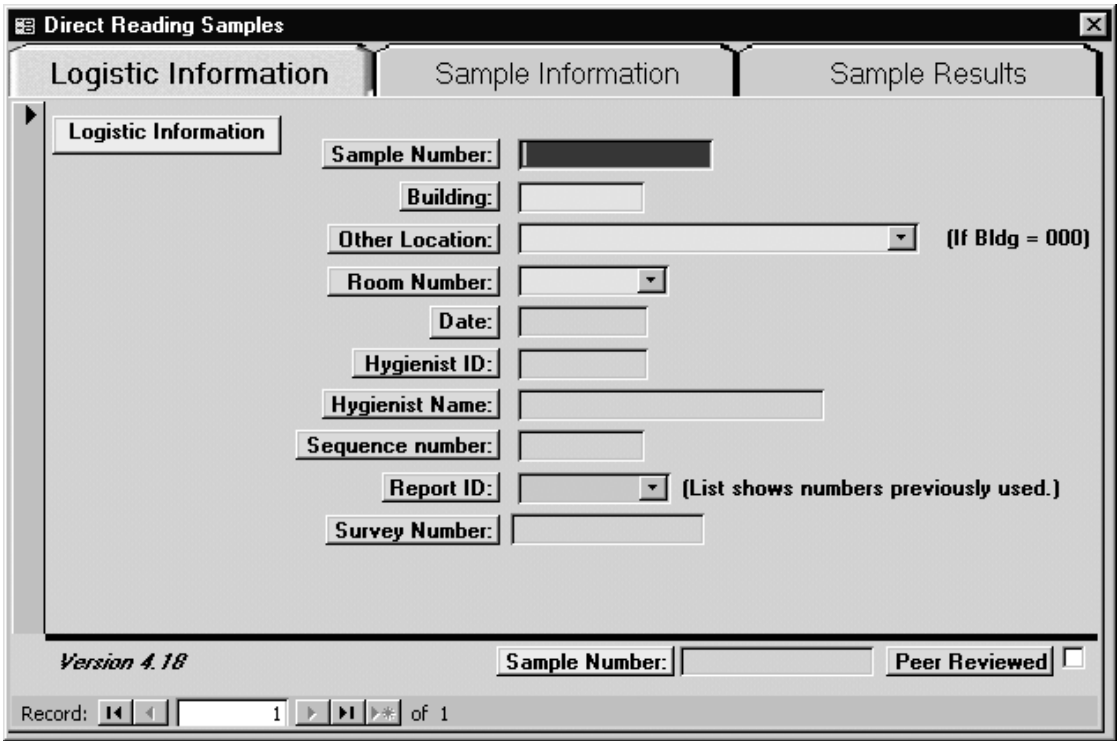


Figure 9 – Direct Reading Sample form Logistic Information page

2.3.1.1 Sample Number

This field is a required field that contains the sample number for the direct reading sample. The format is the same as for Air Samples and composed of the building, the date, and the hygienist ID. The values entered in this field determine the values of other fields in the form. The format of the sample number is BBB-YY/MM/DD-IH-SS where BBB is the building number, YY is the two digit year, MM is the two digit month, DD is the two digit day of the month, IH is the hygienist ID number, and SS is a two digit sequence number indicating the sample number for that day by that hygienist. An example would be 371-96/08/23-99-01.

2.3.1.2 Building

This field contains the building number which the sample was performed in. This field will automatically be filled in from the sample number but can be modified to give more detail.

2.3.1.3 Other Location

This is an optional field that contains data identifying the location of the sample if the sample was not performed in a building. This value may be selected from the drop down list, or a value may be typed in if it is not found among the drop down list items. Examples might be valve vault or cargo container.

2.3.1.4 Room Number

This field contains the room number in which the sample was taken. Only one room number is to be entered per sample. The value may be selected from the list or may be typed in.

2.3.1.5 Date

This field does not allow data entry, and is automatically filled in from the sample number representing the date the sample was collected.

2.3.1.6 Hygienist ID

This field does not allow data entry or modification. The field is automatically filled in from the sample number and consists of a unique two digit number for each hygienist.

2.3.1.7 Hygienist Name

This field does not allow data entry or modification and is automatically looked up and filled in using the hygienist ID from the sample number. New hygienists can be added using the Maintain Hygienists button on the Switchboard form.

2.3.1.8 Sequence Number

This field contains the sequence number for the sample. The field does not allow data entry, and is filled in from the sample number. The hygienist starts a new sequence of numbers each day starting at one (01) to insure that each sample has a unique number.

2.3.1.9 Report ID

This field contains the three digit report ID which the sample will be included in. The report ID may be selected from the drop down list, which contains previously used report ID's for the hygienist who performed the sample, or a new number may be added.

2.3.1.10 Survey Number

The survey number field does not allow data entry, but is automatically filled in from the industrial hygienist ID, the year of the sample, and the report ID. The format of the Survey Number is IH-YY-###. The use of a Survey number allows a group of samples to be easily grouped in a report.

2.3.2 Sample Information page

The fields on this page allow the user to enter general information regarding the sample such as the reason the sample was taken and the instrument used to take the sample.

2.3.2.1 Sample Type

On the direct reading form, the Sample Type is optional. However, if entered, the value still must be selected from the drop-down list of options displayed when the down arrow is selected. Possible values are:

Area	A sample taken in a particular area to estimate ambient concentrations.
Breathing zone	A sample taken by placing a filter or tube in the breathing zone of a worker for an entire task or work period.
Blank	A sample submitted to a laboratory as a field or media blank.
Spike	A sample submitted to a laboratory with a known amount of contaminant to provide a quality assurance test.
Source	A sample taken as close to a process as possible in order to estimate a worst case exposure from the process.
Unknown	A designation reserved mostly for historical samples where the sampling method is unknown.

2.3.2.2 Reason for Sample

This field contains the reason for the sample being performed. The value may be selected from the drop down list, or may be typed in.

2.3.2.3 Instrument

This field contains the instrument that was used to collect the sample. The value may by selected from the drop down list, or may be typed in. Examples of values for this field include detector tube or photoionization detector.

2.3.2.4 Type of Work Area

The type of work area may be described by selecting a value from the drop down list. Possible values are outdoor, indoor, confined space, or other. No other values may be entered in this field.

2.3.2.5 Engineering Controls

The engineering control used may be selected from the drop down list. Possible values are lab hood, local exhaust, HEPA vacuum, glove box, enclosure, charcoal drum filter, and none. Additional engineering controls may be added using the Add New Controls command button.

2.3.2.6 Work Package

This field allows the user to select a value from the drop down list, or to type in a value manually. The field represents the work package or work order number that the work was performed under.

2.3.2.7 Representative Employee ID's

This field contains employee ID numbers for employees whose exposure is represented by the sample. Since there can be multiple employee ID numbers for one sample, this field is contained in a subform. Direct reading samples cannot be directly linked to employees in the same way as standard integrated air samples. Representative employee ID numbers must be selected from the drop down list. New employees can be added using the Maintain Employees command button on the Switchboard.

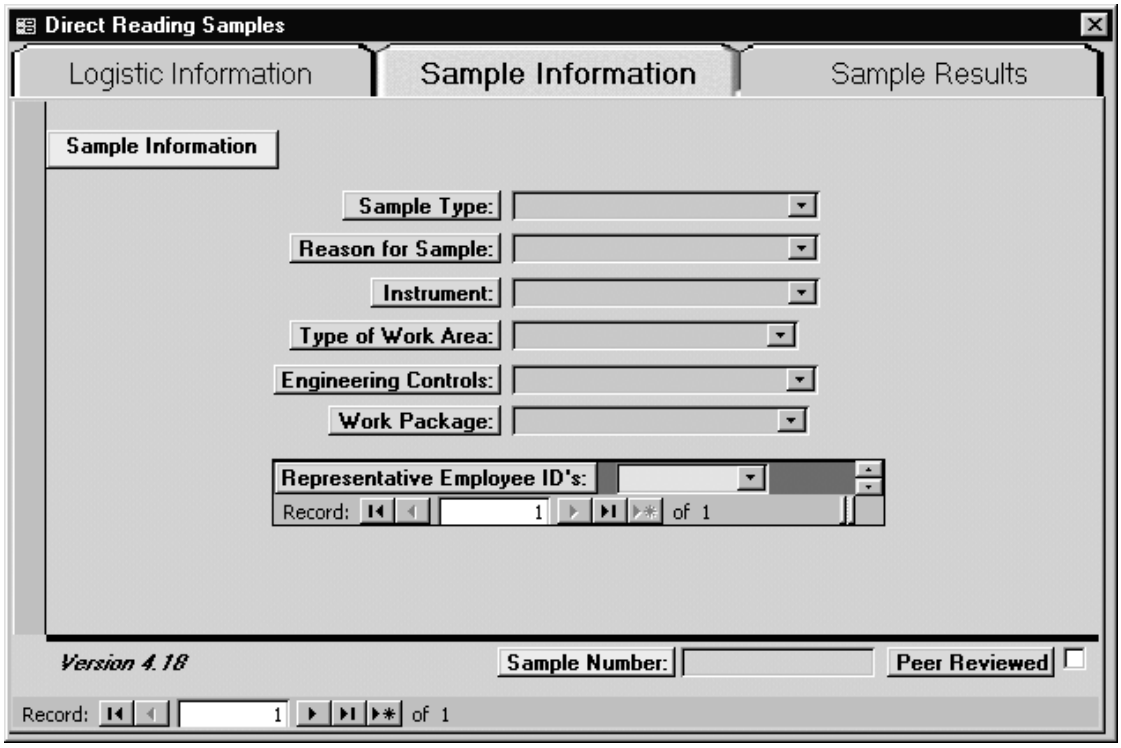


Figure 10 – Direct Reading Sample form Sample Information page

2.3.3 Sample Results page

This page contains fields which record the results of the direct reading sample. As it is possible to have multiple agents per sample, all of the fields on this page are contained in a subform.

2.3.3.1 Agent

This field contains the agent that was tested by the direct reading sample. The value in this field may be selected from the list or may be typed in once an agent has been entered, it will automatically be added to the drop-down list. With direct reading samples, multiple measurements can be added for the same agent under a single sample number. For example when using an organic vapor meter during drum handling activities measurements can be added for opening the drum, transferring its contents, and closing the drum using the same sample number.

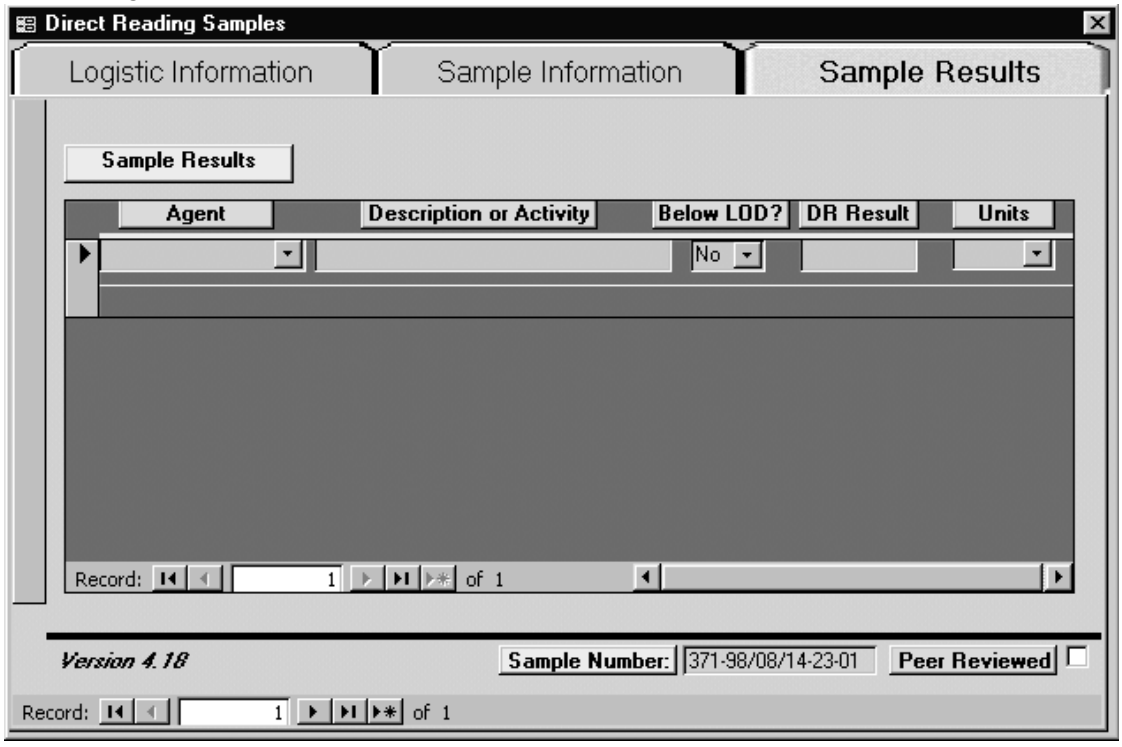


Figure 11 – Direct Reading Sample form Sample Results page

2.3.3.2 Description or Activity

This field contains a description of the material involved or of the activity performed while the sample was taken. Examples might include opening solvent drum, cleaning degreasing tank, or cutting solvent delivery pipe.

2.3.3.3 Below LOD?

This field indicates whether the results for that agent from the sample were below the limit of detection for that agent using that instrument. Possibilities include Yes or No. If the sample is below the limit of detection for the instrument "Yes" should be entered in the Below LOD field and the numeric limit of detection for the instrument should be entered in the DR Result field. Zeros should not be entered.

2.3.3.4 DR Result

This field contains the numeric concentration for the sampled agent given by the direct reading instrument. This field requires a value in numeric characters.

2.3.3.5 Units

This field contains the units of measurement for the result given by the direct reading instrument. The value may be selected from the list or may be typed in. Once the value has been entered, it will be permanently added to the drop-down list. Common units of measurement for direct reading instruments include parts per million and milligrams per cubic meter.

2.4 Bulk Samples Form

Fields in the Bulk Samples form contain information relevant to bulk samples such as location, type of material, and percent of the agent of concern. Due to the smaller number of fields on this form, it does not contain tabs like the Air Sample and Direct Reading Sample forms.

2.4.1 Logistic Information Section

2.4.1.1 Sample Number

This field is a required field containing the sample number for the bulk sample. The field is exactly the same as on the Air Sample form and Direct Reading Sample form. The values entered in this field determine the values of other fields in the form. The format of the sample number is BBB-YY/MM/DD-IH-SS where BBB is the building number, YY is the two digit year, MM is the two digit month, DD is the two digit day of the month, IH is the hygienist ID number, and SS is a two digit sequence number indicating the sample number for that day by that hygienist. An example would be 371-96/08/23-99-01.

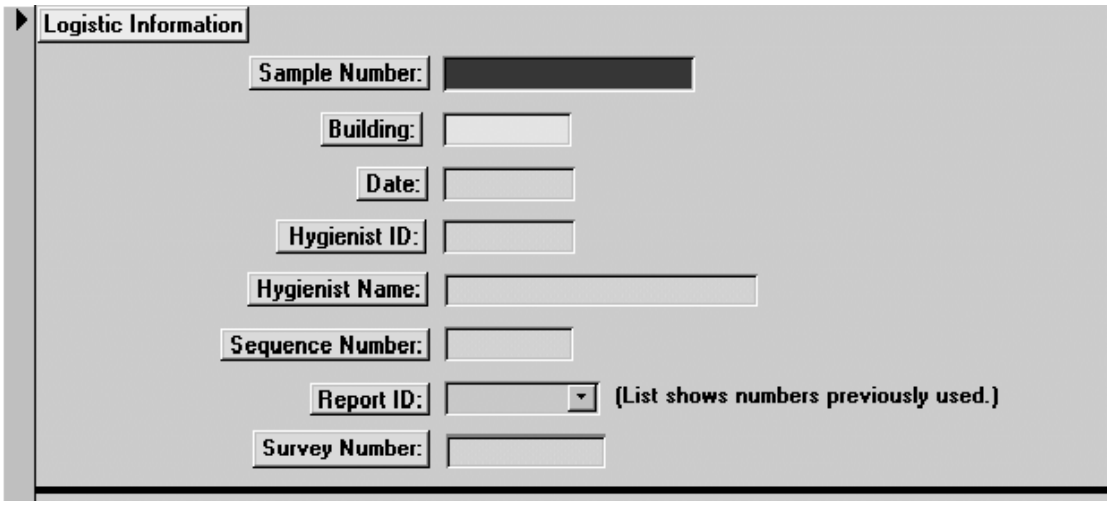


Figure 12 – Bulk Sample form Logistic Information section

2.4.1.2 Building

This field contains the building number where the sample was collected. This field will automatically be filled in from the sample number but can be modified to give more detail.

2.4.1.3 Date

This field does not allow data entry, and is automatically filled in from the sample number representing the date the sample was collected.

2.4.1.4 Hygienist ID

This field does not allow data entry or modification. The field is automatically filled in from the sample number and consists of a unique two digit number for each hygienist.

2.4.1.5 Hygienist Name

This field does not allow data entry or modification and is automatically looked up and filled in using the hygienist ID from the sample number. New hygienists can be added using the Maintain Hygienists button on the Switchboard form.

2.4.1.6 Sequence Number

This field contains the sequence number for the sample. The field does not allow data entry, and is filled in from the sample number. The hygienist starts a new sequence of numbers each day starting at one (01) to insure that each sample has a unique number.

2.4.1.7 Report ID

This field contains the three digit report ID which the sample will be included in. The report ID may be selected from the drop down list, which contains previously used report ID's for the hygienist who performed the sample, or a new number may be added.

2.4.1.8 Survey Number

The survey number field does not allow data entry, but is automatically filled in from the industrial hygienist ID, the year of the sample, and the report ID. The format of the Survey Number is IH-YY-###. The use of a Survey number allows a group of samples to be easily grouped in a report.

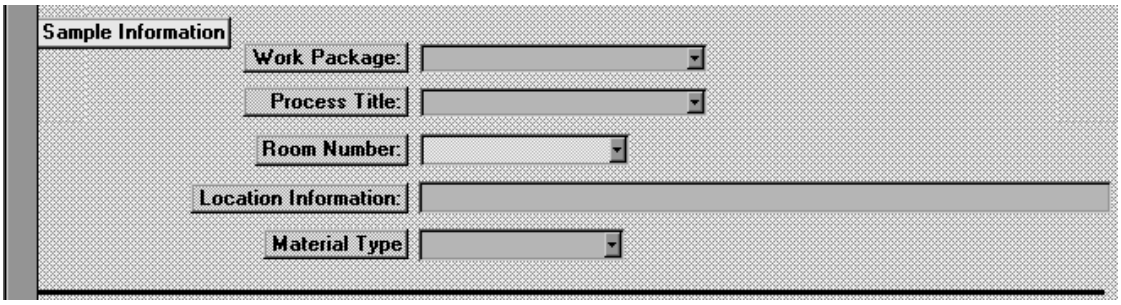


Figure 13 – Bulk Sample form Sample Information section

2.4.2 Sample Information Section

2.4.2.1 Work Package

This field allows the user to select a value from the drop down list, or to type in a value manually. The field represents the work package or work order number that the work was performed under. After a value has been entered once, it is permanently added to the drop-down list.

2.4.2.2 Process Title

This field contains the title for the process from which the sample was taken. The value may be selected from the drop down list, or may be entered manually. After a value has been entered once, it is permanently added to the drop-down list.

2.4.2.3 Room Number

This field contains the room number in which the sample was taken. Only one room number is to be entered per sample. The value may be selected from the list or may be typed in. After a value has been entered once, it is permanently added to the drop-down list.

2.4.2.4 Location Information

This field contains additional information about the location where the sample was taken such as center of North wall or ceiling tile in Northwest corner.

2.4.2.5 Material Type

This field contains the type of material tested in the sample. The value may be selected from the drop down list or may be entered manually. New values are automatically added to the drop-down list. Examples of material type might be pipe lagging, insulation, or floor tile.

2.4.3 Sample Results Section

The fields in this section may contain multiple values for each sample. For this reason, these fields are contained within a subform.

2.4.3.1 Layer

Laboratories generally create a layer by layer report for bulk samples, especially lead and asbestos samples. For this reason a layer field has been included. This field can be represented with numbers (1, 2, 3 , ….) or letters (a, b, c, …) indicating the respective layer of the substrate.

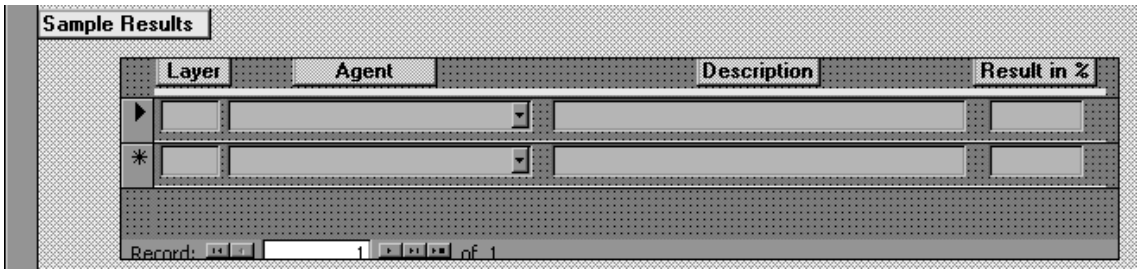


Figure 14 – Bulk Sample form Sample Results section

2.4.3.2 Agent

This field contains the agent tested for in the sample. The value may be selected from the drop down list or may be typed in. New entries are automatically added to the drop down list. Examples of bulk sample agents are chrysotile and lead.

2.4.3.3 Description

This field contains a description of the material tested. This is a free-form text field where general descriptions can be entered.

2.4.3.4 Result in %

This field contains the percentage of the agent tested in the material. The value must be numeric and should be reported as a percentage.

2.5 Miscellaneous Forms

These forms are used in the event that new look -up information must be added for employees, agent , engineering controls, personal protective equipment, work descriptors or hygienists.

2.5.1 Maintain Personnel

This form is used to add new employee information when the employee is not present in the drop down list of the Employee ID field or when a new employee is added to the workforce. Most of the information on this form is available from a typical human resources department.

2.5.1.1 Employee ID

This is a required field containing the employee ID number. The application is set up to use four digit employee ID numbers.

2.5.1.2 Employee SSN

This field is for the employee's social security number.

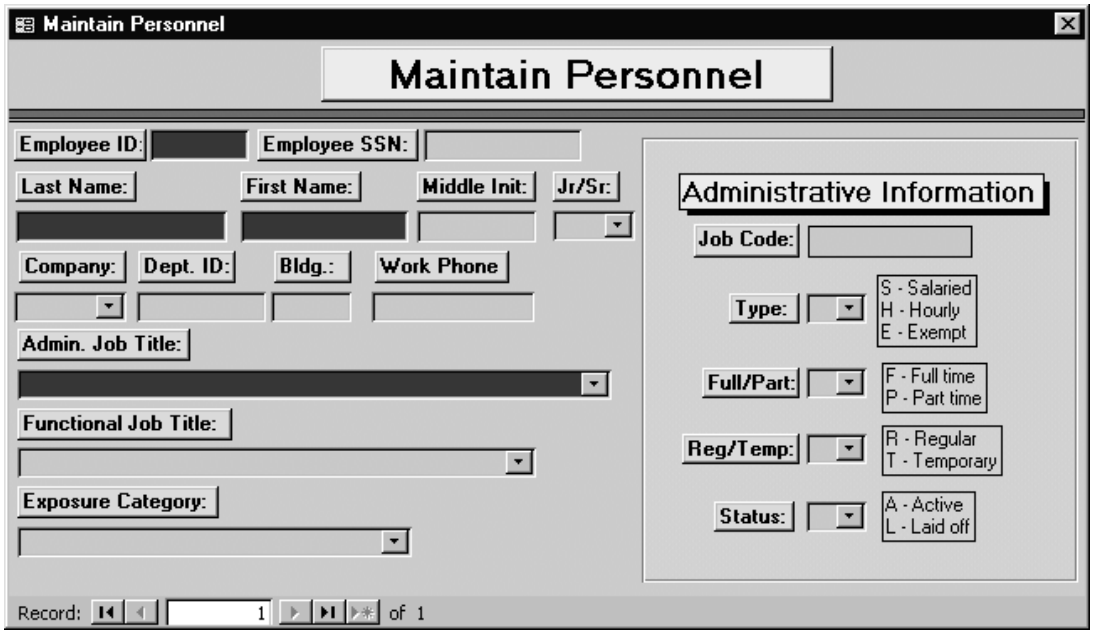


Figure 15 – Maintain Personnel form

2.5.1.3 Last Name

This field is for the employee's last name.

2.5.1.4 First Name
This field is for the employee's first name.

2.5.1.5 Middle Init
This field is for the employee's middle initial.

2.5.1.6 Jr/Sr
This field is for a Junior or Senior designation, if appropriate.

2.5.1.7 Company
This field is for the company the employee is employed by.

2.5.1.8 Dept. ID
This field is for the ID number of the department the employee works in.

2.5.1.9 Bldg
This field is for the building number the employee works in.

2.5.1.10 Work Phone
This field is for the employee's work phone number.

2.5.1.11 Admin. Job Title
This field is for the employee's full administrative job title, that is, the job title assigned to the employee for payroll or personnel purposes.

2.5.1.12 Functional Job Title
This field is for the employee's functional job title, that is, the job title describing the tasks the employee performs on a daily basis. This is usually similar to the administrative job title with designations such as Associate or Senior removed. A full listing of current functional job titles is outlined in Appendix III.

2.5.1.13 Exposure Category
This field is used to assign employees to exposure categories. Current categories in use are outlined in Appendix III.

2.5.1.14 Job Code
This field is for administrative purposes and shows the job code for the given job title.

2.5.1.15 Type
This field is for the employee's salary type, whether salaried, hourly, or exempt.

2.5.1.16 Full/Part
This field is used to designate whether the employee works full-time or part-time.

2.5.1.17 Reg/Temp
This field is for the employee's status, a regular employee or a temporary employee.

2.5.1.18 Status
This field is for the employee's working status, whether an active employee or laid-off.

2.5.2 Maintain Hygienists
This form allows the user to add a new hygienist

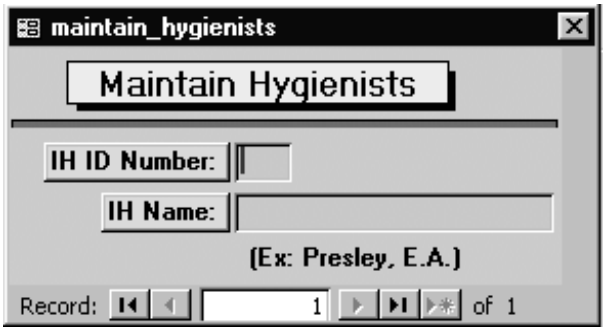


Figure 16 – Maintain Hygienists form

2.5.2.1 IH ID Number
This field is for the new industrial hygienist's ID number consisting of a unique two digit number.

2.5.2.2 IH Name
This field is for the industrial hygienist's name, to be entered with the last name first then a comma followed by a space and the first and middle initials.

2.5.3 Maintain Agents
This form allows the user to enter or modify information pertaining to a chemical agent used in the Air Sample form including PEL's and TLV's.

2.5.3.1 Select Agent
This field allows the user to select an agent from the drop down list in order to modify the information contained in the remaining fields. This field is not functional when adding a new agent that is not in the drop down list.

2.5.3.2 Agent Name
This is a required field containing the common name for the agent. In general, the names should conform to those found in OSHA's PEL tables.

2.5.3.3 CAS #
This is an optional field containing the Chemical Abstracts Service number for the agent.

2.5.3.4 Sort Name
This is a required field that contains the sort name for the agent in the drop down list for the Select Agent field. The sort name is usually the same as the

agent name. The only time it is different is in a situation where it would not be sorted properly by the agent name. For example, 1,3-Butadiene would be sorted at the very beginning of the list, but it is easier to locate this agent with the other Butadiene agents, so the sort name for this agent is Butadiene.

2.5.3.5 Value

This field contains the comparison value for the agent listed. This is the value that will be used in all comparison calculations in the application. It is important to insure that the value is correct for the unit of measure listed in the Lab Units and TWA Units fields.

2.5.3.6 TWA Units

This is a required field that contains the units of measurement used for the time-weighted average exposure for the agent. These units are used in all comparison calculations for air samples.

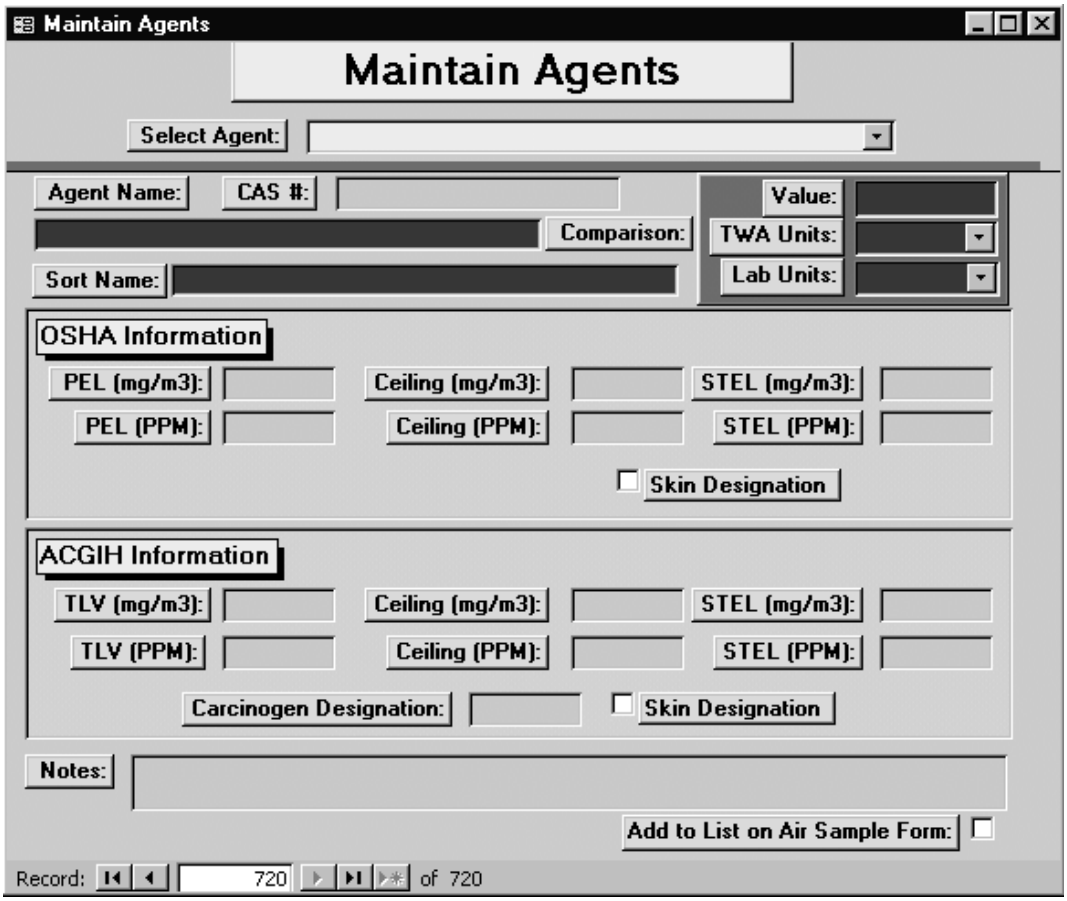


Figure 17 – Maintain Agents form

2.5.3.7 Lab Units

This is a required field that contains the units of measurement used by the lab on analysis reports for the agent.

2.5.3.8 OSHA Information section
This section of the form contains exposure limits as promulgated by the Occupational Safety and Health Administration.

2.5.3.8.1 PEL (mg/m3)
This field contains the OSHA Permissible Exposure Limits (PEL) for the agent in milligrams per cubic meter.

2.5.3.8.2 Ceiling (mg/m3)
This field contains the OSHA Ceiling Limit for the agent in milligrams per cubic meter.

2.5.3.8.3 STEL (mg/m3)
This field contains the OSHA Short Term Exposure Limit (STEL) for the agent in milligrams per cubic meter.

2.5.3.8.4 PEL (PPM)
This field contains the OSHA Permissible Exposure Limits (PEL) for the agent in parts per million.

2.5.3.8.5 Ceiling (PPM)
This field contains the OSHA Ceiling Limit for the agent in parts per million.

2.5.3.8.6 STEL (PPM)
This field contains the OSHA Short Term Exposure Limit (STEL) for the agent in parts per million.

2.5.3.8.7 Skin Designation
This check box indicates whether or not the agent has an OSHA Skin Designation.

2.5.3.9 ACGIH Information section
This section of the form contains the exposure limits as set forth by the American Conference of Governmental Industrial Hygienists (ACGIH) for the agent listed.

2.5.3.9.1 TLV (mg/m3)
This field contains the ACGIH Threshold Limit Value for the agent in milligrams per cubic meter.

2.5.3.9.2 Ceiling (mg/m3)
This field contains the ACGIH ceiling concentration for the agent in milligrams per cubic meter.

2.5.3.9.3 STEL (mg/m3)
This field contains the ACGIH Short Term Exposure Limit (STEL) for the agent in milligrams per cubic meter.

2.5.3.9.4 TLV (PPM)
This field contains the ACGIH Threshold Limit Value for the agent in parts per million.

2.5.3.9.5 Ceiling (PPM)
This field contains the ACGIH ceiling concentration for the agent in parts per million.

2.5.3.9.6 STEL (PPM)
This field contains the ACGIH Short Term Exposure Limit (STEL) for the agent in parts per million.

2.5.3.9.7 Carcinogen Designation
This field contains the ACGIH carcinogen designation.

2.5.3.9.8 Skin Designation
This check box indicates whether or not the agent has an OSHA Skin Designation.

2.5.4 Maintain Controls
This form allows the user to add or modify engineering controls or personal protective equipment descriptions.

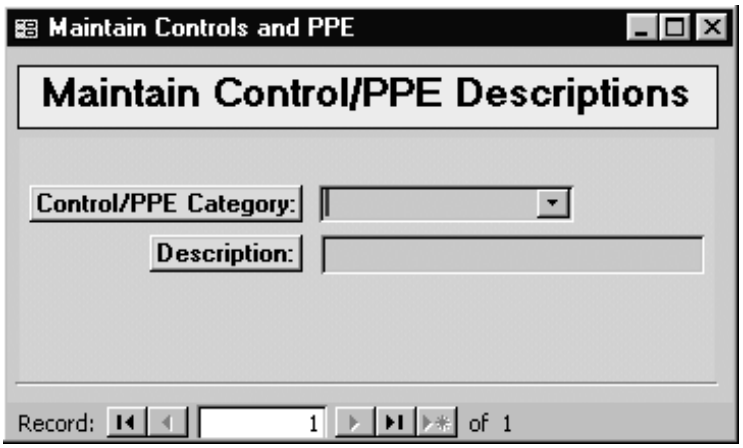


Figure 18 – Maintain Control/PPE Descriptions form

2.5.4.1 Control/PPE Category
This field allows the user to select an engineering control or personal protective equipment category to add equipment to or to modify equipment in. The category must be selected from the drop down list.

2.5.4.2 Description
This field contains a description of the engineering control or personal protective equipment.

2.5.5 Maintain Work Descriptors
This form allows the user to add additional work types and task groups to describe worker activities during air samples.

2.5.5.1 ID

This field allows the user to add a new work descriptor ID. It is import to follow the existing format to insure that the ID's are sorted properly.

2.5.5.2 Work Type

This field allows the user to either type in a value or select it from the list. This field contains a description of the type work performed.

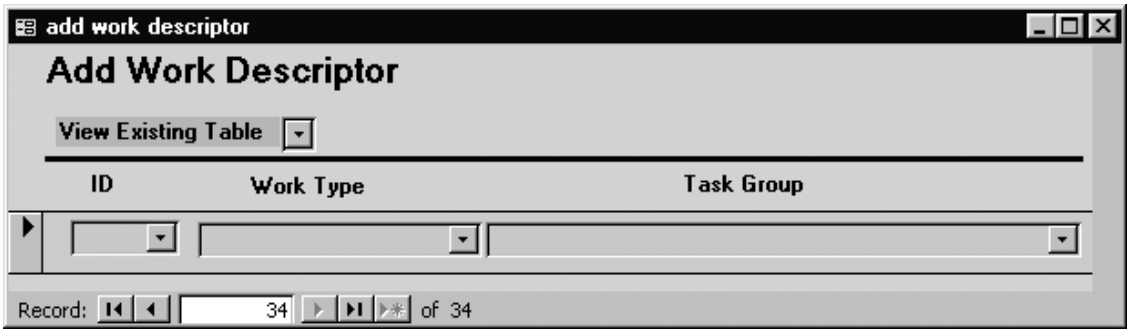


Figure 19 – Add New Work Descriptors form

2.5.5.3 Task Group

The value for this field may be selected from the list or may be typed in. The value in this field describes the task group, which represent the group of tasks performed during a particular operation.

Chapter 3

Entering Data

Chapter 3
Entering Data in the Forms

1. Data Entry Instructins
    - 1.1. Air Samples Form
        - 1.1.1. Adding a record
            - 1.1.1.1. Step by Step
            - 1.1.1.2. Adding a new employee
            - 1.1.1.3. Adding new controls
            - 1.1.1.4. Adding new agents
            - 1.1.1.5. Adding new work descriptors
        - 1.1.2. Editing a record
        - 1.1.3. Peer Reviewing a record
    - 1.2. Direct Reading Samples Form
    - 1.3. Bulk Samples Form
    - 1.4. Maintain Personnel
    - 1.5. Maintain Hygienists
    - 1.6. Maintain Agents
    - 1.7. Maintain Controls

1.1 Air Samples Form

In this form, the user can perform multiple tasks including adding a record, editing a record, or peer reviewing a record.

1.1.1 Adding a record

To add a new record to the Air Samples form, click on the button marked Add Record, as shown, under the appropriate heading:

1.1.1.1 Step by Step

1. Click the Add Record button to enter the form. A blank record will be displayed.

2. Enter the sample number in the first field following the format outlined in Chapter 2.

3. Select the Tab button on the keyboard. The Building, Date, Hygienist ID, Hygienist Name, and Sequence number will be filled in from the sample number.

4. Select the down arrow on the Sample Type drop-down list and choose the appropriate sample type from the list.

5. Enter information in the appropriate remaining fields on the page.

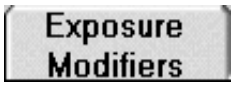
6. If the sample is a breathing zone sample, Select the Employee tab, if not, continue to the Exposure Modifiers page.

7. Enter the Employee ID by selecting the value from the drop down list. If the employee is not in the list, he/she may be added to the list by selecting the Add New Employee command button. See topic 1.1.1.2 for an explanation of this process.

8. Once the Employee ID has been selected, press the Tab key on the keyboard and the following fields will be filled in: Employee First Name, Middle Name/Initial, Employee Last Name, Jr/Sr.

9. Enter the ID's of any employees considered to have similar exposures in the Representative Employee ID's subform.

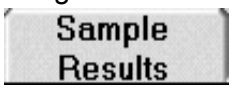
10. Select the Exposure Modifiers tab.

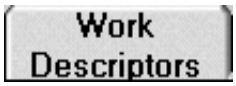


11. Enter the information in the fields on this page by choosing from the drop-down lists.

12. If the desired engineering controls or personal protective equipment are not in the list, it may be added by clicking the Add New Controls command button. See topic 1.1.1.3 for an explanation of this process.

13. Select the Sample Information tab.

14. Enter the Reason for Sample by selecting from the drop-down list and then the sampling time in minutes and the average flow rate in liters per minute.
15. Select the Sample Results tab. 

16. Enter the agent by selecting it from the drop-down list and type in the lab results.
17. If a contaminant is not found in the drop down list of the Contaminant field, a new contaminant may be added to the list by selecting the Add New Agents command button. See topic 1.1.1.4 for a description of this process.
18. Select the Work Descriptors tab. 

19. Select the work descriptor ID from the drop-down list and enter the task duration in percent
20. If a new work descriptor must be added, select the Add New Work Descriptors command button. See topic 1.1.1.5 for a description of this process.
21. Click on the right facing arrow with the asterisk to add another new record. 

1.1.1.2 Adding a new employee

To add a new employee to the drop down list on the Employee ID field of the Employee page, select the Add New Employee button. 

When the button is selected, the Maintain Personnel form will open.
Fill in the fields of the form with the appropriate information for the employee being added. The Employee ID, Last Name, First Name, and Admin. Job Title fields must be completed. Once all the information available for the employee is added to the form, select the close button in the top right corner of the form. The added employee may now be added to the employee page of the Air Samples form by selecting him/her from the drop down list on the Employee ID field.

1.1.1.3 Adding new controls

To add new engineering controls or personal protective equipment, select the Add New Controls command button. When the button is 

selected, the Maintain Controls form will open. Select the control or personal protective equipment (PPE) category that the new control or PPE belongs to from the drop down list of the Control/PPE Category field. In the Description field, type in the name or a brief description of the new engineering control or PPE. Select the close button in the top right corner of the form. The new control or PPE will now be available to select from the drop down list of the appropriate category.

1.1.1.4 Adding new agents

To add a new agent, select the Add New Agents command button from the Sample Results page of the Air Samples form. 

When the button is selected, the Maintain Agents form will open. The form will display the records for all the agents maintained in the form. Select the new record button at the bottom of the form. A blank record will be displayed. Fill in the appropriate fields with the information available for the new agent. The Agent Name, Sort Name, Value, TWA Units, and Lab Units fields are required and must be filled in. Fill in the remaining fields as appropriate. Select the close button to return to the Sample Results page. The new agent will appear in the drop down list for the field Contaminant.

1.1.1.5 Adding new work descriptors

To add a new work descriptor, select the Add New Work Descriptors command button on the Work Descriptors page of the Air Samples form. The Add New Work Descriptors form will open to a blank record. Fill in the fields of the form as appropriate. To view the data already entered, select the drop down arrow next to the label View Existing Table. Once the form is complete, select the close button. The screen will return to the Work Descriptors page. The new work descriptor may be selected from the drop down list of the ID field.

1.1.1.6 Editing a record

To edit a record, select the Edit Record command button on the Switchboard form. The form will open displaying all the air sample records in the database. Select the filter by form button on the toolbar at the top of the screen. A blank version of the form will appear which allows the user to enter a value to filter the records in any field of the form. Enter the sample number of the record to be edited in the Sample Number field and select the Apply Filter button. Any records meeting the criteria specified will be filtered and displayed. Entering a valid sample number will display the one record matching that sample number. The fields may be edited as needed for that record.

1.1.1.7 Peer-Reviewing a Record

To peer review a record, select the Peer Review command button from the Switchboard form. The form will open displaying only those records that have not been peer reviewed. A check mark in the Peer Reviewed field at the bottom of the form indicates if the record has been peer reviewed. Filter the records as described above, and review the record. When the record has been reviewed, select the Peer Reviewed check box at the bottom of the form so that a check mark appears.

1.2 Direct Reading Samples Form

In this form, the user can add, edit, or peer review a record. The steps in performing these tasks are similar to what is described above for the Air Samples Form.

1.3 Bulk Samples Form

In this form, the user can add, edit, or peer review a record. The steps in performing these tasks are similar to what is described above for the Air Samples Form.

1.4 Maintain Personnel Form

To change any information for an employee, select the Maintain Personnel command button from the Switchboard form. The form will open

displaying all the employee records in the database. Use the filter to display the desired records and make changes as needed. Add new records as outlined in topic 1.1.1.2.

1.5 Maintain Hygienists

To add a hygienist, select the Maintain Hygienists command button from the Switchboard form. Enter the information in the form.

1.6 Maintain Agents

To change any information for an agent, or to add a new agent, select the Maintain Agents command button from the Switchboard form. Use the filter to display the desired record to make changes to and edit as needed. To add a new record, follow the steps outlined in topic 1.1.1.4.

1.7 Maintain Controls

To change any information for any engineering controls or personal protective equipment, select the Maintain Controls command button from the Switchboard form. The form will display all the records maintained in the form. Use the filter to display the desired record and make changes as outlined in topic 1.1.1.3.

Chapter 4

Reports

Chapter 4
Reports

1. Reports
    - 1.1. Accessing the reports
    - 1.2. Reports available
        - 1.2.1. All Samples by Building
        - 1.2.2. Employee Notification
        - 1.2.3. Exposure History
        - 1.2.4. Exposures by Agent
    - 1.3. Creating a report
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            - 1.3.2.1. Parameters
            - 1.3.2.2. Threshold Level
            - 1.3.2.3. Start and End Date
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            - 1.3.2.5. Resetting Empl. Notification
        - 1.3.3. Previewing a report
        - 1.3.4. Printing a report

1. Reports

Reports allow the user to present the data in a hard copy form. In addition, reports allow the user to present parts of the data that the user is interested in seeing as well as group data in specific ways. The reports available and how to create them are described in this chapter.

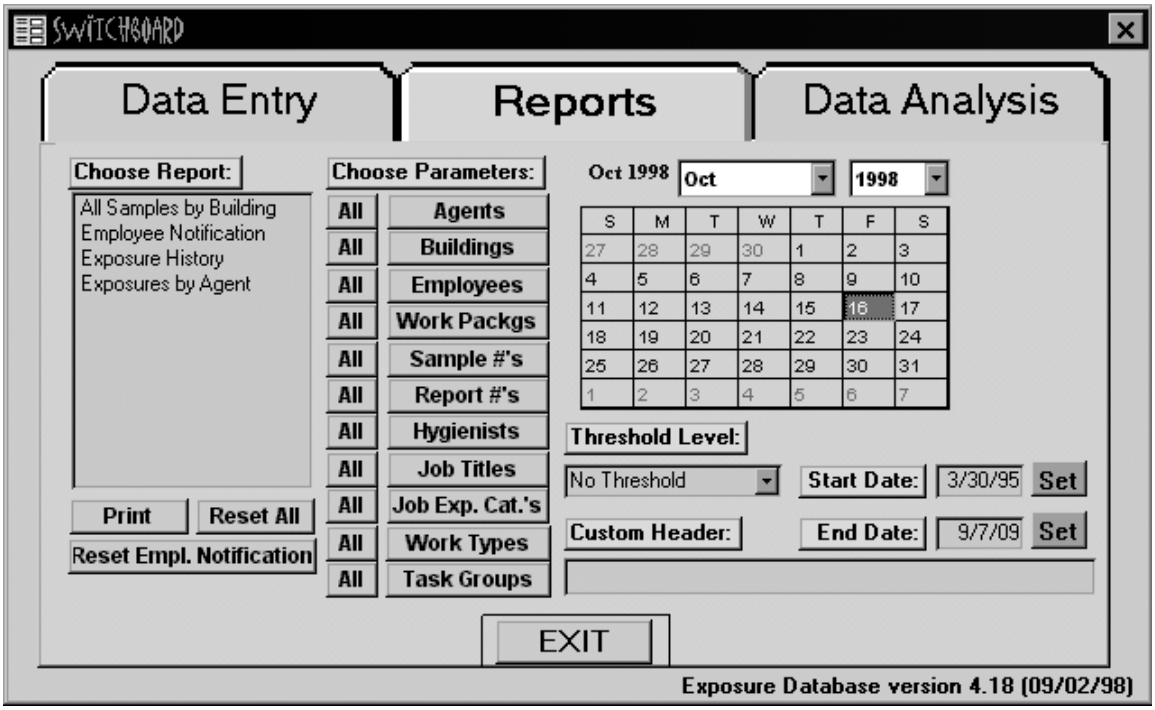


Figure 20 – Switchboard form showing the Reports page

1.1 Accessing the reports

When the Reports tab is selected on the Switchboard form, the reports screen, as shown in Figure 20, is displayed.

1.2 Reports available

The reports available are reports already created that display certain data. Using the Reports screen it is very easy to customize a report to display specific data by simply choosing a report and selecting the constraining parameters necessary to limit the data.

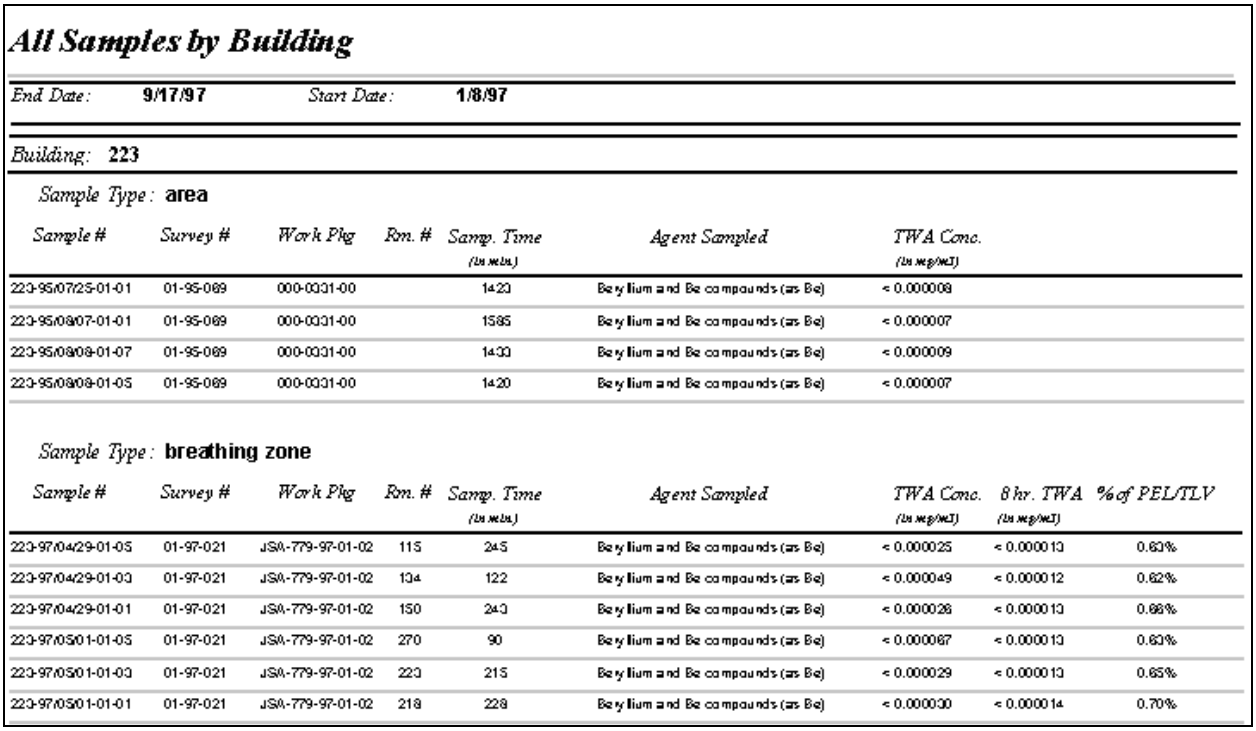
1.2.1 All Samples by Building

This report displays all the samples in the database including blank, breathing zone, area, spike, bulk, and direct reading sorted by the building number an example of this report can be seen in Figure 21. Criteria can be set following the procedure outlined in topic 1.3.

1.2.2 Employee Notification

This report can be used to notify employees of their results from a breathing zone air sample. The Print Notification check box on the Air Samples form is used to indicate that a report should be printed for that sample. When the Employee Notification report is selected on the Reports page of the Switchboard and the Print command button is clicked, Employee Notification reports will be printed for all of the samples with the Print Notification box checked. These check boxes can be cleared by clicking the Reset Empl. Notification command button. Samples can also be chosen using the Sample

Number command button in the Choose Parameters section of the Reports page. An example of an Employee Notification report can be seen in Figure 22.



All Samples by Building

End Date: **9/17/97** *Start Date:* **1/8/97**

Building: **223**

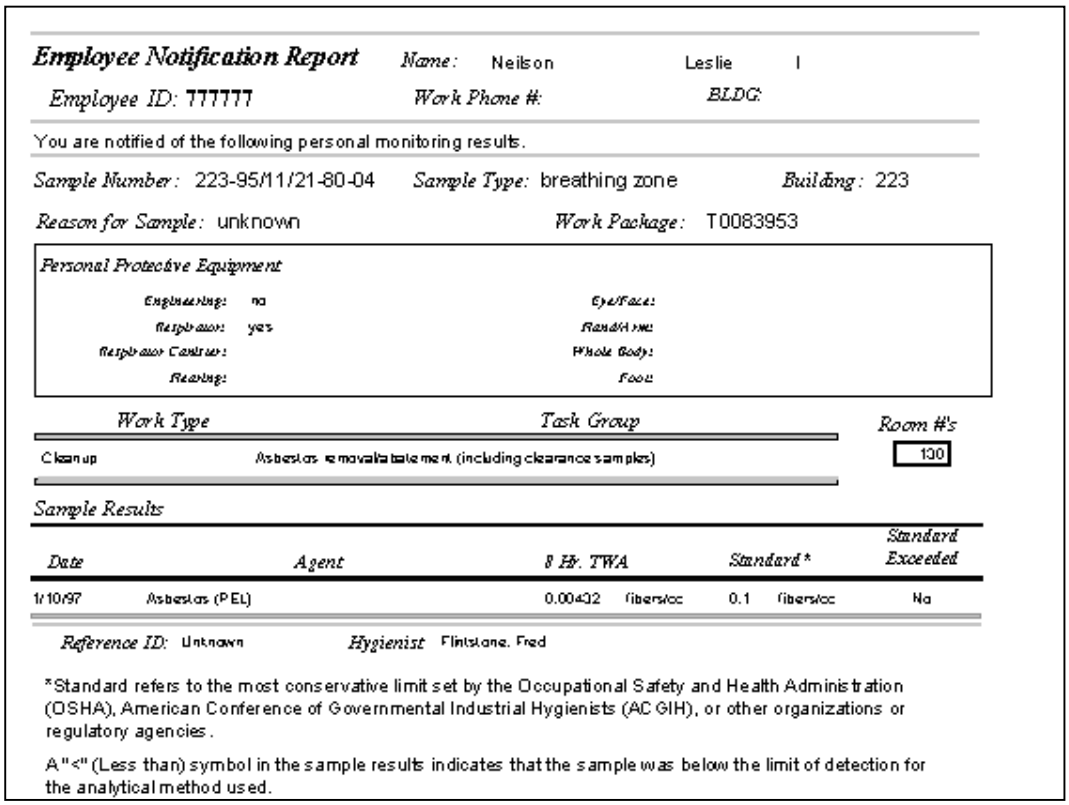
Sample Type: **area**

Sample #	Survey #	Work Pkg	Rm. #	Samp. Time (in mins.)	Agent Sampled	TWA Conc. (in mg/m3)
223-95/07/25-01-01	01-95-089	000-0031-00		1423	Beryllium and Be compounds (as Be)	< 0.000008
223-95/08/07-01-01	01-95-089	000-0031-00		1585	Beryllium and Be compounds (as Be)	< 0.000007
223-95/08/08-01-07	01-95-089	000-0031-00		1430	Beryllium and Be compounds (as Be)	< 0.000009
223-95/08/08-01-05	01-95-089	000-0031-00		1420	Beryllium and Be compounds (as Be)	< 0.000007

Sample Type: **breathing zone**

Sample #	Survey #	Work Pkg	Rm. #	Samp. Time (in mins.)	Agent Sampled	TWA Conc. (in mg/m3)	8 hr. TWA (in mg/m3)	% of PEL/TLV
223-97/04/29-01-05	01-97-021	JSA-779-97-01-02	115	245	Beryllium and Be compounds (as Be)	< 0.000025	< 0.000013	0.63%
223-97/04/29-01-03	01-97-021	JSA-779-97-01-02	104	122	Beryllium and Be compounds (as Be)	< 0.000049	< 0.000012	0.62%
223-97/04/29-01-01	01-97-021	JSA-779-97-01-02	150	240	Beryllium and Be compounds (as Be)	< 0.000026	< 0.000013	0.66%
223-97/05/01-01-05	01-97-021	JSA-779-97-01-02	270	90	Beryllium and Be compounds (as Be)	< 0.000067	< 0.000013	0.63%
223-97/05/01-01-03	01-97-021	JSA-779-97-01-02	220	215	Beryllium and Be compounds (as Be)	< 0.000029	< 0.000013	0.65%
223-97/05/01-01-01	01-97-021	JSA-779-97-01-02	218	228	Beryllium and Be compounds (as Be)	< 0.000030	< 0.000014	0.70%

Figure 21 – All Samples by Building Report



Employee Notification Report *Name:* Neilson Leslie I

Employee ID: 777777 *Work Phone #:* *BLDG:*

You are notified of the following personal monitoring results.

Sample Number: 223-95/11/21-80-04 *Sample Type:* breathing zone *Building:* 223

Reason for Sample: unknown *Work Package:* T0083953

Personal Protective Equipment

Engineering:	no	Eye/Face:	
Respirator:	yes	Hands/Arms:	
Respirator Cartridge:		Whole Body:	
Hearing:		Feet:	

Work Type	Task Group	Room #'s
Clean up	Asbestos removal/abatement (including clearance samples)	130

Sample Results

Date	Agent	8 Hr. TWA		Standard *		Standard Exceeded
1/10/97	Asbestos (PEL)	0.00402	fibers/cc	0.1	fibers/cc	No

Reference ID: Unknown *Hygienist* Flintstone, Fred

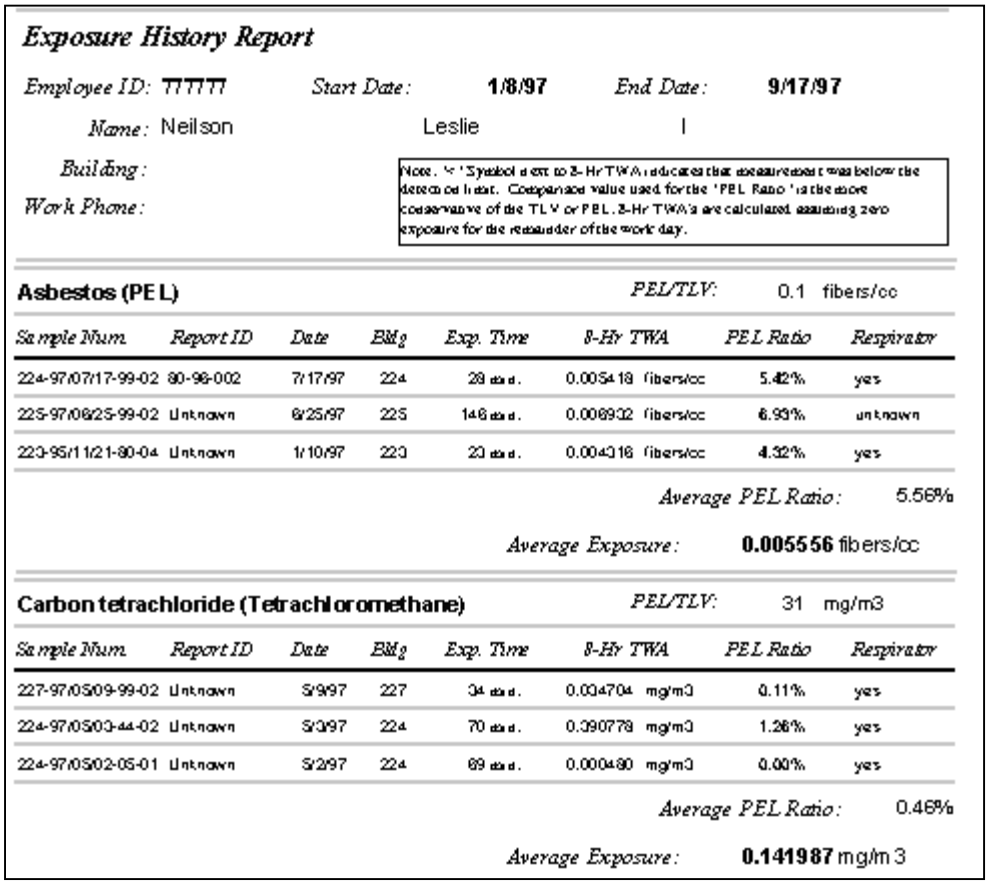
*Standard refers to the most conservative limit set by the Occupational Safety and Health Administration (OSHA), American Conference of Governmental Industrial Hygienists (ACGIH), or other organizations or regulatory agencies.

A "<" (Less than) symbol in the sample results indicates that the sample was below the limit of detection for the analytical method used.

Figure 22 – Employee Notification Report

1.2.3 Exposure History

This report displays all breathing zone samples in the database sorted by employee number and agent. An example of this report can be seen in Figure 23. Criteria can be set following the procedure outlined in topic 1.3.



Exposure History Report

Employee ID: 777777 *Start Date:* **1/8/97** *End Date:* **9/17/97**

Name: Neilson Leslie I

Building:

Work Phone:

Note: '<' Symbol next to 8-Hr TWA indicates that measurement was below the detection limit. Comparison value used for the 'PEL Ratio' is the more conservative of the TLV or PEL. 8-Hr TWA's are calculated assuming zero exposure for the remainder of the work day.

Asbestos (PEL) *PEL/TLV:* 0.1 fibers/cc

Sample Num	*Report ID*	*Date*	*Bldg*	*Exp. Time*	*8-Hr TWA*	*PEL Ratio*	*Respirator*
224-97/07/17-99-02	80-96-002	7/17/97	224	28 min.	0.005418 fibers/cc	5.42%	yes
225-97/08/25-99-02	Unknown	8/25/97	225	146 min.	0.006932 fibers/cc	6.93%	unknown
223-95/11/21-80-04	Unknown	1/10/97	223	23 min.	0.004316 fibers/cc	4.32%	yes

Average PEL Ratio: 5.56%

Average Exposure: **0.005556** fibers/cc

Carbon tetrachloride (Tetrachloromethane) *PEL/TLV:* 31 mg/m3

Sample Num	*Report ID*	*Date*	*Bldg*	*Exp. Time*	*8-Hr TWA*	*PEL Ratio*	*Respirator*
227-97/05/09-99-02	Unknown	5/9/97	227	34 min.	0.034704 mg/m3	0.11%	yes
224-97/05/03-44-02	Unknown	5/3/97	224	70 min.	0.390778 mg/m3	1.26%	yes
224-97/05/02-05-01	Unknown	5/2/97	224	69 min.	0.000480 mg/m3	0.00%	yes

Average PEL Ratio: 0.46%

Average Exposure: **0.141987** mg/m3

Figure 23 – Exposure History Report

1.2.4 Exposures by Agent Report

This report displays all breathing zone samples in the database sorted by agent. An example of this report can be seen in Figure 24. Criteria can be set following the procedure outlined in topic 1.3.

1.3 Creating a report

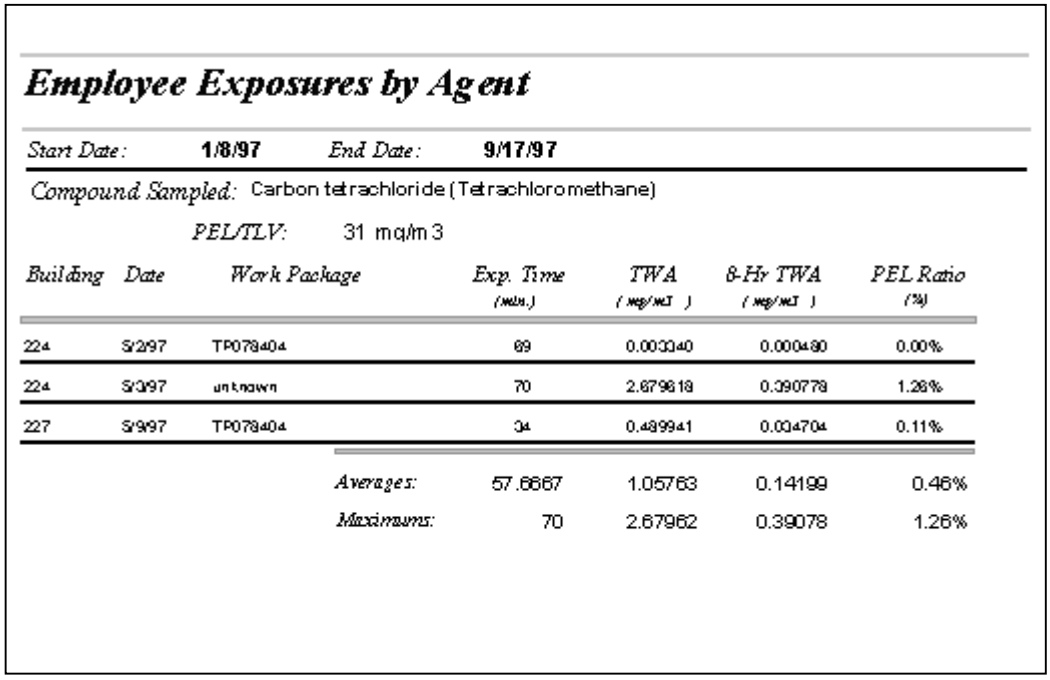
To create a report, select the desired report from the Choose Report list box. Once a report is selected, the available parameters for that report will appear to the right under the heading Choose Parameters. Select the desired criteria to limit the data displayed in the report. Preview the report to make sure it looks as it should. Print the report.

1.3.1 Customizing a report

A report may be customized by entering a new title for the report into the Custom Header field on the reports page of the Switchboard form in addition various constraining parameters can be added to select only the data of interest.

1.3.2 Selecting Criteria

Specifying criteria values allows the user to limit the data to only the specific agent, building, task, etc. that the user is interested in reviewing in a given report.



Employee Exposures by Agent

Start Date: **1/8/97** *End Date:* **9/17/97**

Compound Sampled: Carbon tetrachloride (Tetrachloromethane)

PEL/TLV: 31 mg/m3

Building	Date	Work Package	Exp. Time (min.)	TWA (mg/m3)	8-Hr TWA (mg/m3)	PEL Ratio (%)
224	5/2/97	TP078404	69	0.003040	0.000480	0.00%
224	5/3/97	unknown	70	2.679618	0.390778	1.26%
227	5/9/97	TP078404	34	0.489941	0.004704	0.11%
		Averages:	57.6667	1.05763	0.14199	0.46%
		Maximums:	70	2.67962	0.39078	1.26%

Figure 24 – Exposures by Agent Report

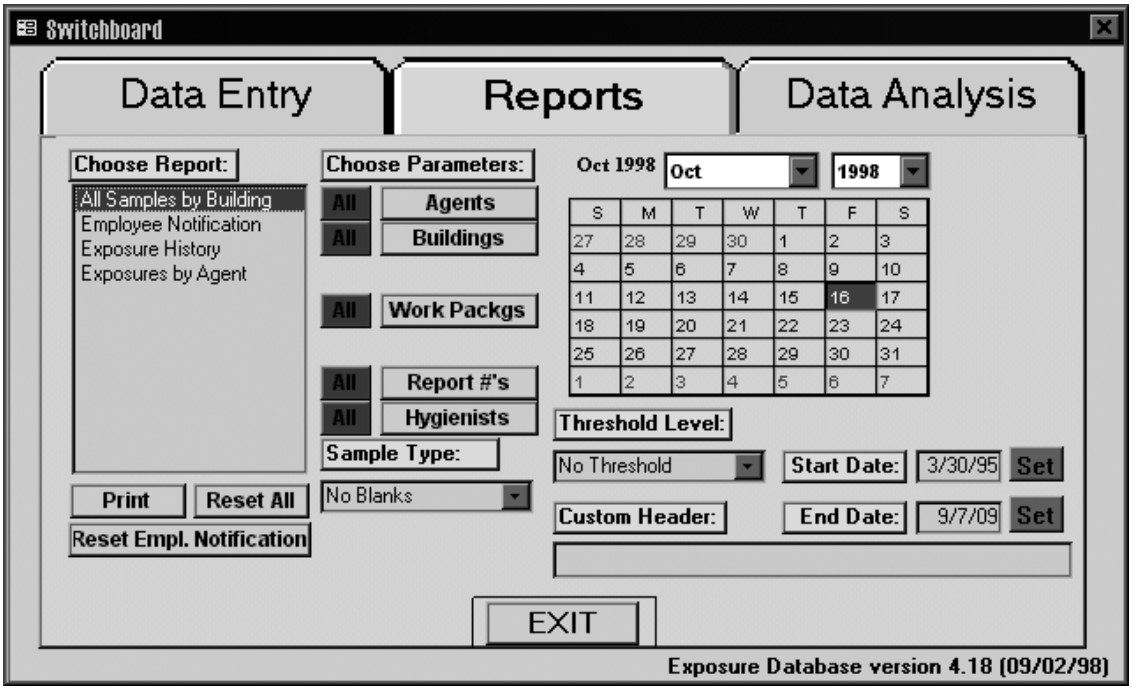


Figure 25 – Reports page showing criteria selection

1.3.2.1 Parameters

Each report has a set of parameters that may be modified so that the data displayed in the report is limited. The parameters that may be set depends on the report selected. When the report is first selected, all the parameter values are selected. To modify a parameter, select the parameter desired under the heading Choose Parameters, a list of the values under that parameter will appear, as shown below:

Select the check box in the Print? Column beside the desired value. Multiple parameter values may be selected. Once the parameter values are chosen, the close button may be selected to return to the reports screen. If all parameter values are desired for a parameter, select the All button. When a report is first selected, the All button is already selected. Figure 26 shows the screen used for selecting specific agents. Table II shows the parameters available for each report type.

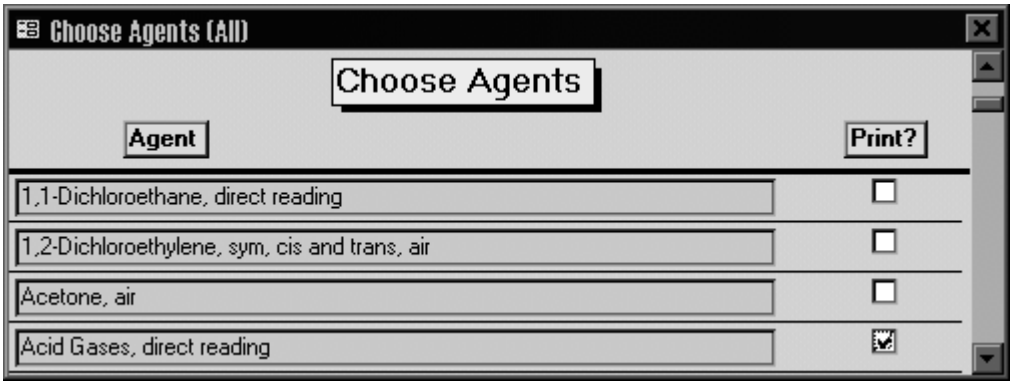


Figure 26 – Criteria selection form for agents

Table II – Available selection criteria for each report type

Criteria	All Samples by Building	Employee Notification	Exposure History	Exposures by Agent
Date	Yes	No	Yes	Yes
Threshold Level	Yes	No	Yes	Yes
Sample Type	Yes	No	No	No
Agent	Yes	No	Yes	Yes
Building	Yes	No	Yes	Yes
Employee	No	No	Yes	Yes
Work Package	Yes	No	Yes	Yes
Sample Number	No	Yes	Yes	Yes
Report Number	Yes	No	Yes	Yes
Hygienist ID	Yes	No	Yes	Yes
Functional Job Title	No	No	Yes	Yes
Exposure Category	No	No	Yes	Yes

1.3.2.2 Threshold Level

Selecting the threshold level will limit the data displayed based on the sample results for breathing zone samples only. For example, if only samples at or above 50% of the relevant Occupational Exposure Limit (OEL) are desired, selecting 50% of OEL from the Threshold Level drop down list will display only

breathing zone samples where the results were 50% of the OEL or greater on the report.

1.3.2.3 Start and End Date

To display samples performed during a given time, select the start and end date for the desired sample range. To enter either a start or end date the value may be entered in the appropriate field, or they may be selected from the calendar. To use the calendar, select the appropriate month and year to display the calendar for the appropriate date. Choose the desired day on the calendar and select the Set button to the right of either the start or end date fields. This will set the date in the field. Note that the end date must not be before the start date.

1.3.2.4 Reset All

The reset all button will reset the parameters for a report so that all the criteria are chosen. This will be visible in that the All buttons to the left of the parameters for the report will be highlighted in red. This action removes all set criteria.

1.3.2.5 Resetting Employee Notification

To print an employee notification, the Print Notification? check box in the Air Samples form is selected. After these reports have been printed, selecting the Reset Empl. Notification button will remove all the check marks from the Print Notification? boxes so that when the report is run again, the same records are not included.

1.3.3 Previewing a report

To preview a report, after all the criteria have been selected, click on the Print button. The report will be displayed as it will look when printed.

1.3.4 Printing a report

To print a report, preview the report as described above, and then click on the Print button located on the toolbar at the top of the screen. The report will be printed to the default printer. If certain printing options are desired, select the Print option from the File menu and select the desired options in the dialog box.

Chapter 5

Data Analysis

Chapter 5
Data Analysis

1. Data Analysis
    1.1. Accessing the analyses
    1.2 Analyses available
        1.2.1 Cumulative Histograms
        1.2.2 Stacked Bar Distributions
    1.3 Creating an analysis
        1.3.1 Customizing an analysis
        1.3.2 Selecting Criteria
            1.3.2.1 Grouping Levels
        1.3.3 Previewing a report
        1.3.4 Printing a report

1. Data Analysis

Analyses allow the user to present the data in a way that it is easy to identify trends in the data. In addition, analyses allow the user to focus in on a possible area of concern by viewing a large quantity of data in a graphical format. The analyses available and how to create them are described in this chapter.

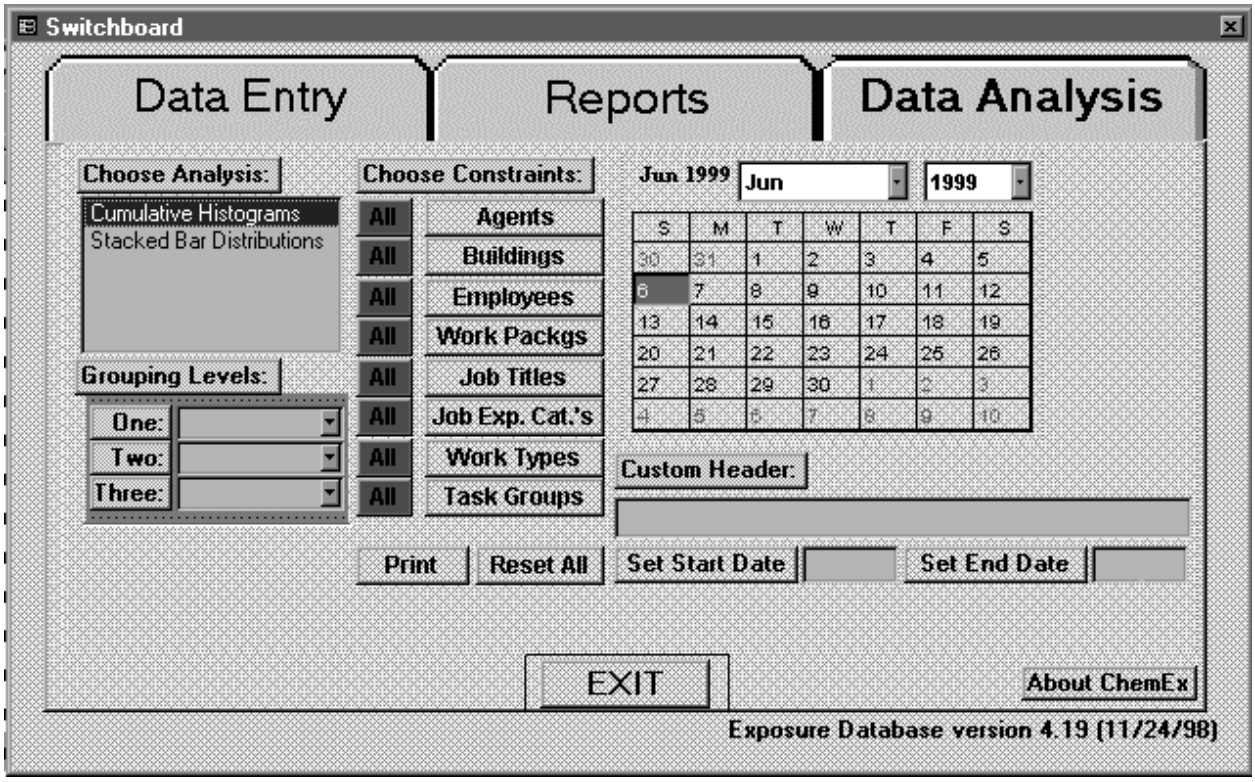


Figure 27 – Switchboard form showing Data Analysis page

1.1 Accessing the reports

When the Data Analysis tab is selected on the Switchboard form, the Data Analysis screen, as shown in Figure 27, is displayed.

1.2 Analyses available

The analyses available are already created to display data in a graphical manner. Using the Data Analysis screen it is very easy to customize an analysis to display specific data by simply choosing the analysis and selecting the constraining parameters necessary to limit the data.

1.2.1 Cumulative Histograms

This analysis uses cumulative histograms to show the distribution of the data relative to the relevant occupational exposure limit. The analysis shows only breathing zone samples. Criteria can be set in exactly the same manner as for the reports. The analysis allows quick and easy visual identification of problem exposure areas. An example of this type of analysis is shown in Figure 28.

1.2.2 Stacked Bar Distributions

This analysis is similar to the cumulative histogram analysis in that it shows the distribution of the data relative to the relevant occupational exposure limit. However, this analysis uses a stacked bar graph with different colors representing different levels of exposure. This analysis also allows quick and easy visual identification of problem exposure areas. An example of this type of analysis is shown in Figure 29.

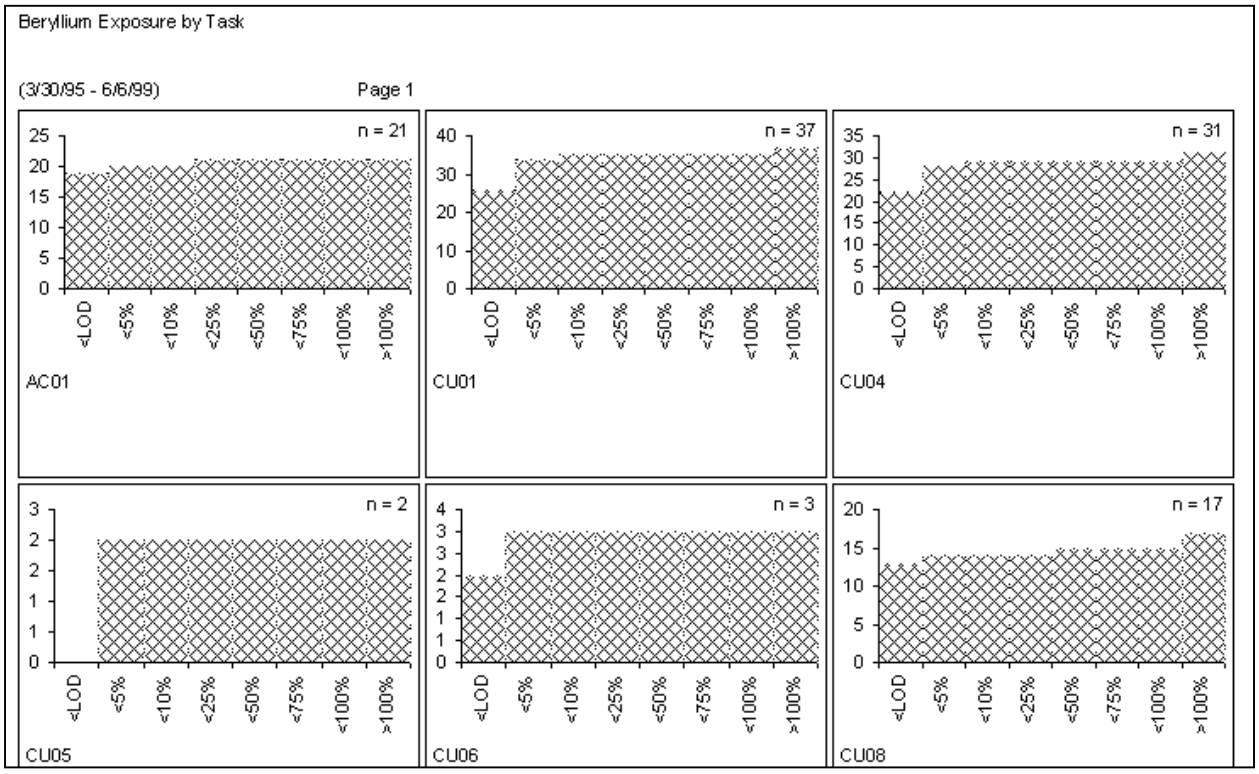


Figure 28 – Example of a Cumulative Histogram analysis

1.3 Creating an analysis

To create an analysis, select the desired analysis from the Choose Analysis list box. Once an analysis is selected, the available parameters for that analysis will appear to the right under the heading Choose Parameters. Select the desired criteria to limit the data displayed in the analysis. Choose from one to three grouping levels using the drop-down list boxes under the heading Grouping Levels. Preview the report to make sure it appears as it should. Print the report.

1.3.1 Customizing an analysis

An analysis may be customized by entering a new title for the analysis into the Custom Header field on the Data Analysis page of the Switchboard form. Up to three grouping levels can also be specified. Finally, various constraining parameters can be added to select only the data of interest.

1.3.2 Selecting Criteria

Specifying criteria values allows the user to limit the data to only the specific agent, building, task, etc. that the user is interested in reviewing in a given analysis. Selecting criteria parameters is performed exactly the same as in generating a report as described in Chapter 4. Criteria available for each type of analysis is shown in Table III.

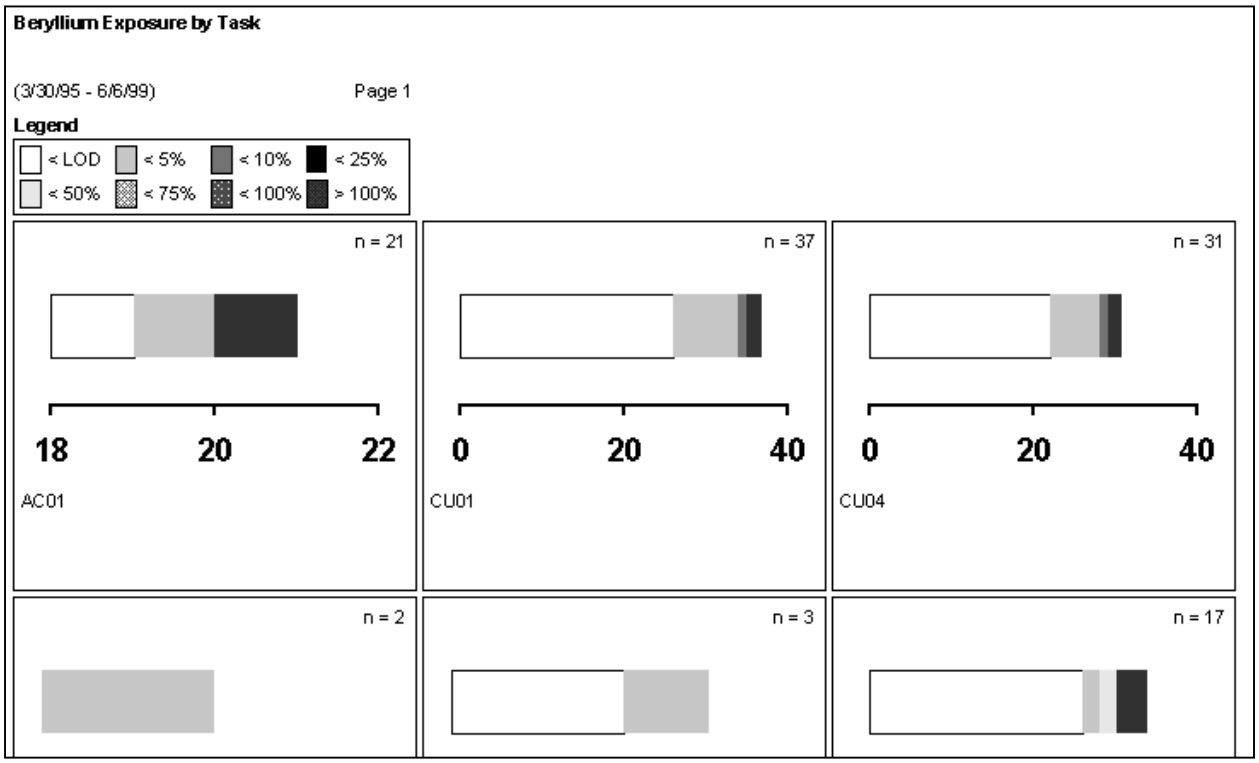


Figure 29 – Example of a Stacked Bar Distribution analysis

Table III – Available selection criteria for each analysis type

Criteria	Cumulative Histograms	Stacked Bar Distributions
Date	Yes	Yes
Agent	Yes	Yes
Building	Yes	Yes
Employee	Yes	Yes
Work Package	Yes	Yes
Functional Job Title	Yes	Yes
Exposure Category	Yes	Yes
Task Group	Yes	Yes
Work Type	Yes	Yes

1.3.2.1 Grouping Levels

Analyses are created in the same way reports are created with one difference, grouping levels must be specified. Up to three grouping levels can be specified. These grouping levels determine how the data will be shown on the page. For example, the user may specify Building for grouping level one and agent for grouping level two. The resulting analysis would show a separate stacked bar or cumulative histogram for each unique combination of building and agent (e.g., building x formaldehyde, building y formaldehyde, building x acetone, building y toulene, etc.) This is a very powerful system for quickly grouping data and viewing differences in distributions. The following criteria are available for selection any of the three possible grouping levels:

- Agent
- Building
- Employee ID
- Exposure Category
- Functional Job Title
- Task Group
- Work Package
- Work Type

1.3.3 Previewing an analysis

To preview an analysis, after all the criteria have been selected, click on the Print button. The analysis will be displayed as it will look when printed.

1.3.4 Printing an analysis

To print an analysis, preview the analysis as described above, and then click on the Print button located on the toolbar at the top of the screen. The analysis will be printed to the default printer. If certain printing options are desired, select the Print option from the File menu and select the desired options in the dialog box.